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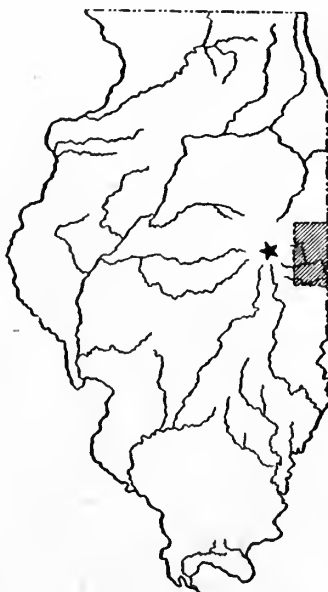
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UNIVERSITY OF ILLINOIS Agricultural Experiment Station

SOIL REPORT No. 62

VERMILION COUNTY SOILS

By HERMAN WASCHER, R. S. SMITH, AND L. H. SMITH



URBANA, ILLINOIS, JUNE, 1938

"It must be remembered that the productive power of the soil is the basic support of all prosperity."

C. G. HOPKINS

"It is the duty of every landowner to see that his land when he leaves it is as good or better than when he received it."

J. G. MOSIER

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INTRODUCTORY NOTE

IT IS A MATTER of common observation that soils vary tremendously in their productive power, depending upon their physical condition, their chemical composition, and their biological activities. For the most advantageous utilization of the land a definite knowledge of the existing kinds or types of soil is a first essential, and for any comprehensive plans for the improvement and the maintenance of our agricultural soils this knowledge is likewise necessary. It is the purpose of a soil survey to classify the various kinds of soil of a given area in such a manner as to permit definite characterization for description and for mapping. With the information that such a survey affords, every farmer or landowner of the surveyed area has at hand the basis for a rational system for the improvement of his land. At the same time the Experiment Station is furnished a scientific inventory of the soils of the state; and with such an inventory as a basis it can proceed intelligently to plan those fundamental investigations so necessary for the solution of problems of practical soil improvement.

This county soil report is one of a series reporting the results of the soil survey which, when completed, will cover the state of Illinois. Each county report is intended to be as nearly complete in itself as it is practicable to make it, even at the expense of some repetition.

While the authors must assume the responsibility for the presentation of this report, it should be understood that the materials in it represent the contributions of a considerable number of the present and former members of the Agronomy Department working in their respective lines of soil mapping, soil analysis, and experiment field investigation.

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VERMILION COUNTY SOILS

By HERMAN WASCHER, R. S. SMITH, and L. H. SMITH¹

GEOGRAPHICAL FEATURES

VERMILION COUNTY lies along the eastern border of Illinois nearly midway in the state from north to south. It is rectangular in shape, averaging about 21.5 miles wide by 42 miles long, and it has an approximate area of 886 square miles.

The first permanent settlements in the county were made about 1820 along Vermilion river and its larger tributaries. These streams furnished water and a convenient means of transportation, while their wooded bluffs furnished shelter and fuel for the early settlers. A group of salt springs at the base of Salt Fork bluff near its junction with Middle Fork apparently attracted many of the first white settlers. A small monument at the top of the bluff, along Route 10, indicates approximately where these springs were located, tho they have long since disappeared.

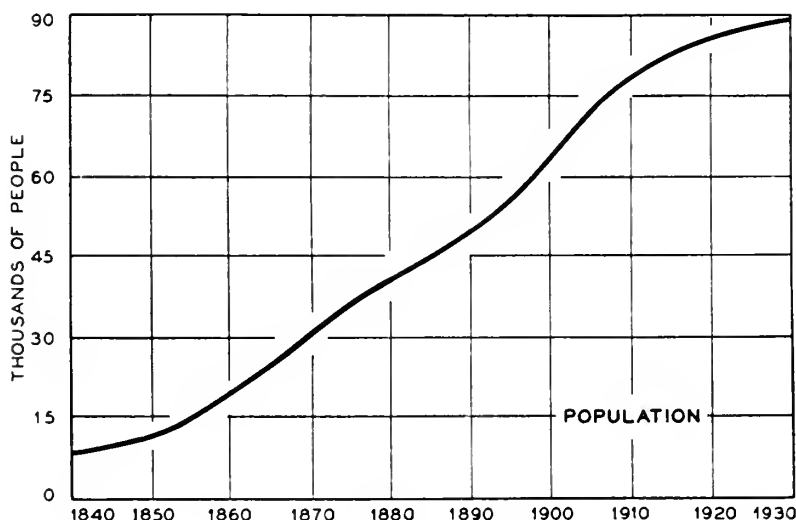


FIG. 1.—GROWTH OF POPULATION IN VERMILION COUNTY

The population increased steadily from 1840, the year of the first U. S. Census, when 9,300 people were counted, until 1930, when there were 89,400 inhabitants.

Vermilion county, prior to its official organization in 1826, included by common consent a large area in the central and northern parts of the state. In 1827 a site for the county seat was chosen at the junction of North Fork and Vermilion rivers; and Danville, now the principal city as well as the county seat, was built on this site. By 1840 there were 9,300 inhabitants in the county, according to the U. S. Census. Following 1850 the increase in population was rapid until 1920.

¹HERMAN WASCHER, Assistant Chief in Soil Survey; R. S. SMITH, Chief in Soil Survey; and L. H. SMITH, Chief in Charge of Publications of the Soil Survey.

when there were 86,200 inhabitants. Since about 1910 the increase has been somewhat less rapid, the 1930 Census Report showing a total population of 89,400 for the county (Fig. 1).

Altho the population has been predominantly urban for a good many years, owing to the ready accessibility of the coal seams to the south and west of Danville, nevertheless agriculture has been an important factor in the steady increase in population and in the present wealth of the county. In addition to the many coal mines, a few sand and gravel pits and clay pits are being commercially operated at the present time, and the limestone quarry south of Fairmount has furnished crushed stone for much of the road surfacing as well as being the source of some agricultural limestone.

Facilities for the marketing of agricultural products are well established. Direct routes to Chicago and Indianapolis are available both by railway and paved highway systems, while Danville absorbs a considerable portion of the local production of fruit, vegetable, and dairy products. The county has always been a leader in rural farm-to-market road improvement and at the present time has hard surfacing on somewhat more than three-fourths of all its country roads, including gravel and single-width concrete pavements. Several double-width "thru-routes" also traverse the county. Route 119, east from Armstrong to the state line, has been constructed since the soil map was made, and other road changes may be made before this report is circulated. Of the 3,600 farmsteads located on rural roads, 2,400 are served directly by some form of all-weather roads, according to the 1930 Census. This number has undoubtedly increased to some extent since that date.

Agricultural Production

In spite of the large amount of coal mined in Vermilion county, agriculture has always been a major factor in the production of wealth in this county.

Corn is the most important field crop from the standpoint of both acreage and value. For more than fifty years an average of about 195,000 acres¹ has been given over to the production of corn. The year-to-year fluctuation has been rather wide, however, ranging from an all-time high of 229,000 acres in 1900 to a low of 148,000 acres in 1934. The average yield for the eleven-year period 1924 to 1934 inclusive was 31 bushels an acre, with a high of 43 bushels in 1925 and a low of 16 bushels in 1934. Slightly more than 100,000 acres are annually devoted to the production of oats, while approximately another 100,000 acres are given over to wheat, soybeans, timothy hay, and the legume hays. Barley and rye are of very minor importance in this county.

The average yield of oats for the above-mentioned eleven-year period, 1924 to 1934 inclusive, was 26 bushels an acre, with a high of 38 bushels in 1931 and a low of 10 bushels in 1934. Wheat averaged 17 bushels an acre for the same period, with a high of 25 bushels in 1931 and a low of 9 bushels in 1934. These wide fluctuations in average yield illustrate the importance of climatic variations in this region, tho the extremely low yields of 1934 were due to a combination of

¹All crop and livestock statistics are from either the U. S. Census or "Illinois Crop and Live Stock Statistics."

unfavorable circumstances, including crop diseases and insect pests, as well as the unseasonable drouth of that year.

The area planted to soybeans increased in this county from 3,000 acres in 1926 to 24,000 acres in 1934. The average annual yield was 18 bushels of seed an acre for this period. The annual fluctuation in yield has been less than that

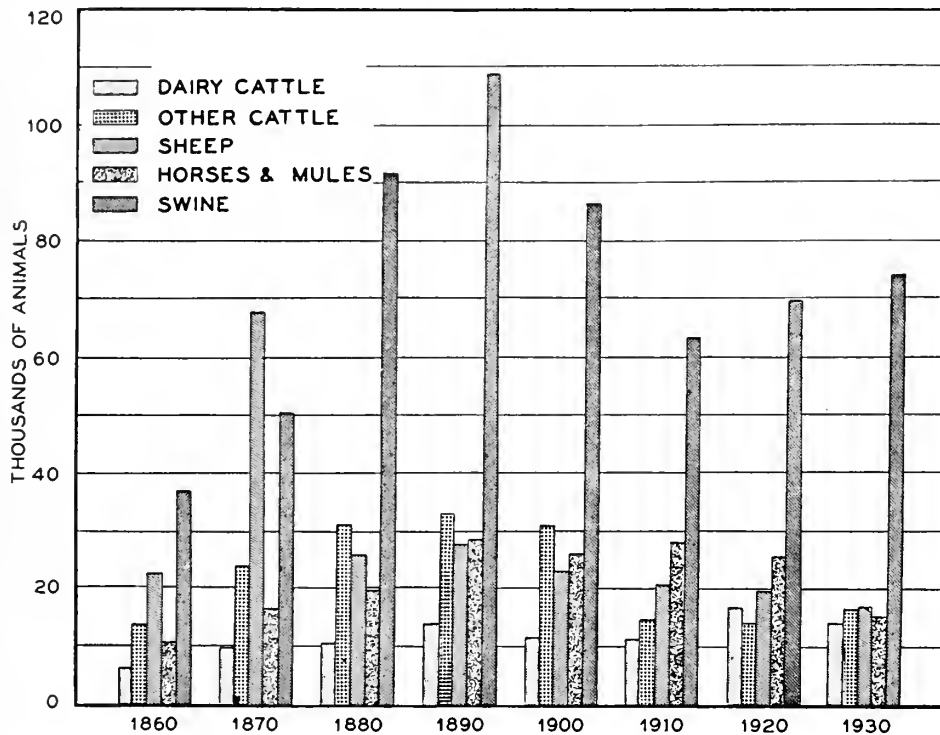


FIG. 2.—PRODUCTION OF PRINCIPAL CLASSES OF LIVESTOCK IN VERMILION COUNTY

Swine have occupied a prominent place in Vermilion county agriculture since early in its development. During the past thirty years around 70,000 head have been carried on the farms in this county. The number of milk cows has ranged in the main from about 10,000 to 15,000 head. Beef cattle numbered about 30,000 head from 1880 to 1900, after which they dropped to about half that number. At the time of the 1870 Census more than 65,000 head of sheep were maintained, but less than 30,000 have been carried since that time. Horses and mules, which reached a peak of nearly 30,000 head in 1890 to 1910, have since followed the general downward trend evident in the country at large, giving way to the automobile and the tractor. (*Figures are from U. S. Census.*)

of the cereals, suggesting that soybeans are not so sensitive to periods of drouth and high temperatures nor so subject to the ravages of insect pests as are corn, wheat, and oats. Seven thousand acres of hemp were grown under contract in the vicinity of Danville in 1937. This crop is not thoroly established as yet and its probable future acreage is a matter of speculation. It is grown on the better silt loam and clay loam soils.

Fruit and vegetable production has assumed an important position in the agriculture of Vermilion county within the last several years, having a total value in 1930 of almost \$400,000.

Forested land has decreased alarmingly since settlement by the white man.

Scarcely 2,300 acres of woodland remained in 1935, according to the U. S. Census, altho 38,800 additional acres were reported as woodland pasture. The original forested area of Vermilion county amounted to more than 109,000 acres.

Some idea of the trend in livestock production may be gained from Fig. 2, in which the number of swine, cattle, sheep, and horses and mules are graphically presented by ten-year intervals beginning with 1860 and ending in 1930. The number of dairy cattle for 1935 was reported to be 15,600, beef cattle 15,300, sheep 16,800, horses and mules 12,100, and swine 47,000.

Livestock production in Vermilion county seemed to reach a peak in about 1890, when the U. S. Census reported the greatest number of beef cattle, horses, and hogs reported in any Census year. Altho the number of dairy cows has not varied greatly since 1890, the quality of animal has improved considerably and milk production has increased from about 3.5 million gallons a year to nearly 6 million gallons.

Poultry and egg production has always been an important source of farm income. More than 1½ million dozen eggs were produced in 1930. Beekeeping is an important side line and may very properly be encouraged in certain areas where an increase in the acreage of alfalfa and sweet clover is recommended.

Climate

The climate of Vermilion county is typical of that prevailing in north-central United States. It is characterized by a wide range in temperature between the extremes of winter and summer, and by a somewhat irregularly distributed rainfall. The mean summer temperature during the twenty-year period 1917 to 1936 inclusive, as taken at the Danville Weather Station, was 73.6° F., while the mean winter temperature was 31.3° F., and the average mean annual temperature 52.7° F. The highest temperature recorded during this period was 112° F. in July, 1936, and the lowest was -23° F. in January, 1924.

The latest killing frost in the spring in the above-mentioned twenty-year weather record occurred on May 26, 1933; the average for all the years was April 29. The earliest killing frost in the fall was September 24, 1928; the average date fell on October 16. The shortest growing season recorded was 134 days in 1928; the longest was 202 days in 1918. The average frost-free growing season in this area is 171 days, which is ample for the crops commonly grown to mature. Occasionally early frosts, however, as that of September, 1928, injure some portion of such crops as corn and soybeans before they have fully matured.

The average annual precipitation at the Danville Weather Station for the twenty-year period 1917 to 1936 inclusive was 36.62 inches. This includes the water melted from an average snowfall of about 17 inches. The driest year in this period was 1930, when there was a total precipitation of only 24.12 inches; while 1927 was the wettest year with 54.3 inches. The driest months were January and February, with an average precipitation of 1.67 inches each. May and September were the wettest months, with an average of 3.95 inches each; while April, June, and August were not far behind, with an average of 3.67 inches for each month. July averaged 2.86 inches during the twenty years. Thus it is apparent that if the average monthly precipitation were evenly distributed and came at regular intervals, there would probably always be sufficient moisture in the soil

for normal plant growth, and sustained drouths would be unknown in this region. However, this is not the case, for protracted rainless periods do occur at rather frequent intervals.

A study of the daily rainfall data from the Danville Weather Station shows that during the growing season (May thru September) for the twenty years 1917 to 1936 inclusive there were 36 periods of more than 20 consecutive days' duration that were unbroken by a rain amounting to a half inch or more, 9 periods of more than 40 days, and 2 periods of more than 60 days' duration. The assumption is here made that ordinarily a rain of less than half an inch is ineffective in breaking a drouth period, tho this is not always true. It is belived that a rainless period of 21 or more days, particularly when it occurs during the critical periods of plant growth and reproduction, will be harmful. Two such periods occurred during the 1927 growing season, in a year of excessive total rainfall. Further, it is felt that periods of 40 or more rainless days may result in damage, and that those of 60 or more days' duration will result in severe damage, as was the case in 1936, when no rain fell (aside from two or three extremely light showers) during the 76-day period extending from May 26 to August 10. Neither the total monthly nor the yearly precipitation is a good criterion of the amount of available moisture present in the soil at any specific time, for departures from the average are frequent and often wide. Furthermore the rate of precipitation, rate of evaporation, and the absorptive and retentive capacity of the soil, as well as other soil and plant characteristics, are all important factors influencing the amount of moisture available for crop production.

Topography and Drainage

The land surface of Vermilion county is rather uneven tho not particularly rough or broken except for a very narrow belt of bluff and gullied land along the larger streams. The county is divided topographically into a southern half and a northern half by the edge of the Outer Bloomington moraine. This moraine, beginning at the state line just northeast of Danville, crosses thru the northern edge of that city and, extending west and northwest, leaves the county just west of the village of Hope. That part of the county lying north of this line is relatively rolling, with only a scattering of small, nearly level areas. South of this line the land surface is generally nearly level but has a scattering of prominent morainal knolls and ridges, particularly along the southern border of the county. This division line will be discussed more fully under "Soil Development," page 10, as it is of geological and soil significance.

The lowest point in the county is the Vermilion river channel at the state line. This point is shown on the topographic map of the United States Geological Survey as being 490 feet above sea level. Several points 790 feet above sea level occur on the Outer Bloomington moraine west of Collison. The general level of the south half of the county ranges from 650 to 700 feet while that of the north half ranges from 680 to 790 feet above sea level.

Drainage is furnished for the most part by Vermilion river and its tributaries. Only a small area in the nothwest corner of the county drains to the north into Iroquois river.

Altho natural streams and drainage lines are well established and provide numerous outlets for the removal of excess surface water, still a few rather level areas occur which had to be artificially dredged before the land could be farmed satisfactorily. The largest of these areas lies between the Salt Fork and Little Vermilion rivers. Another lies west and northwest of Fithian and along the base of the previously mentioned Bloomington moraine. Another occurs around the town of Henning, while others of smaller area and less importance occur in various parts of the county. These areas are all characterized by a predominance of black, heavy, productive soils which will be considered in more detail under the discussion of the individual soil types to follow.

FORMATION OF VERMILION COUNTY SOILS

Origin of Soil Material

The nature of Vermilion county soils can be more readily understood if one knows something of the formation and composition of the material from which they have been derived. The mineral material was deposited during the Glacial Epoch, and it was thru action in glacial times and subsequent erosion that the present topography has been determined. The underlying bed rock, now exposed in a very few places, served as a foundation for the loose, unconsolidated surface mantel that was laid over it but contributed only indirectly to the source of the present soil material.

The average temperature during the glacial periods was lower than at present. Snow and ice collected in regions to the north in such amounts that the masses pushed outward from centers of accumulation forming glaciers. It is believed the important continental glaciers attained a thickness of at least 5,000 or 6,000 feet. These glaciers advanced chiefly southward, aided by further accumulation of snow and ice at their margins, until they reached a region where the climate became warm enough to melt the ice as rapidly as it advanced. In moving across the country from the far north, the ice gathered up all sorts and sizes of materials, including clay, sand, gravel, boulders, and even immense masses of rock. Some of these materials were carried almost intact over great distances, frozen in the ice. Others were rubbed against rock surfaces or between slipping ice masses until ground to powder. The great bulk of material carried, however, was derived from the loose surface mantle and bed-rock material which was usually deposited within a few miles of its origin.

Under the enormous pressure of the ice, hills were leveled off and old valleys filled in, thus greatly changing the features of the surface over which the ice passed and completely obliterating the previous topography. The numerous knolls and ridges making up the present upland topography of Vermilion county are the result of direct glacial deposition. These ridges are known as moraines. The deposits of rock material left by the glaciers are known as glacial drift. As defined by the Illinois State Geological Survey, glacial "drift" includes all material, stratified or unstratified, of glacial origin, whether deposited from the ice itself or by glacial waters; "till" is unstratified drift deposited from the ice directly. The stratified sands and silts deposited on a plain form an "outwash plain." This formation is agriculturally important because of the influence the

sand and gravel outwash material has on underdrainage. Both the terms "till" and "outwash" appear frequently in the soil-type descriptions.

There were at least four periods during which ice sheets moved down from the north. Some of these periods included more than one distinct movement, each of which covered a part of North America, altho the same parts were not necessarily covered during each advance. The movements of the individual ice sheets were separated by long periods of time during which the climate was probably similar to that now existing, and the land was clothed with vegetation. At least two of these glaciers, the Illinoian and the Wisconsin, are known to have covered Vermilion county. The deposit left by the Illinoian is deeply buried by the more recent deposits of the Wisconsin; consequently only material of Wisconsin age has exerted a direct influence on the character of the soils now found in this county.

Since the Wisconsin advance was the last of the great ice sheets, all of the moraines comprizing the various stages of its retreat remain undisturbed except as modified by erosion, and can be readily recognized. Several morainal ridges occur in Vermilion county, and they have been identified by the Illinois State Geological Survey as follows: two branches of the Champaign moraine that cross the southern part of the county south of Salt Fork; the Outer Bloomington moraine, lying across the center of the county, the southern edge of which lies just north of Danville; and the Paxton and Chatsworth moraines which lie across the northern end of the county but which are also classed as part of the Bloomington Morainial System.

Glacial till is by far the most important material from which the soils of Vermilion county have been formed. Tho it is commonly a heterogeneous mixture of sand, silt, clay, gravel, and a scattering of large rocks or boulders, the proportion of these constituents may vary considerably between two moraines or even between different parts of the same moraine or intermorainal area. If a glacier moved across a region in which it could pick up granitic rocks, sandstone, shale, and limestone, the condition would be favorable for the deposition of a very diverse till. This is true of the Wisconsin till sheet in Illinois. In some areas it is made up of very coarse, rocky material which is readily penetrated by water, while in other places it is made up of very fine-grained, clayey material which is very slowly permeable to water. Altho the first of these extreme conditions does not occur in Vermilion county, the latter is present in the northern part of the county.

All of the glacial-till material in Vermilion county originally contained limestone. Laboratory tests made on a number of samples taken from the finer portions of the till have shown several having a calcium carbonate equivalent of 25 to 30 percent.

Wind-blown material, designated as loess, is relatively unimportant in this county. There is a thin coating of silt over most of the southern half of the county, which may be wind-deposited or may be a surface deposit of silty till, or a combination of the two. Insufficient evidence has been secured to date to prove or disprove either method of formation. Some of this silty covering is also present on parts of the front of the Outer Bloomington moraine. It is usually confined to the ridge within a mile of the moraine edge. If any of it were ever

present over the rest of the north half of the county, it was so thin that by now it has become mixed with other materials and cannot be identified.

Outwash is important at the base of most of the moraines, in the region of Henning and in numerous other small areas.

How the Soils Were Developed

As soon as the glacial material was deposited, soil-forming processes began to change it into soil. As these processes acted differently from place to place owing to differences in the original glacial material, in the slope of land surface, in vegetation, and in other factors, the products that were formed, and which we call soils, began to show differences. With the continued action of weathering processes, these differences became more and more pronounced until finally soils with distinctly unlike characteristics were evolved; these are called "soil types."

During the early stages in their life history, soil types are strongly influenced by their parent materials; their distinguishing features are not clearly developed and they are said to be young. The soils of this county are in various stages of the youthful period; and it is for this reason that the character of the glacial-drift deposits in Vermilion county is of more importance, from the standpoint of soils, than it is in geologically older regions. The till of the southern half of the county varies considerably from that of the northern half. It is made up of friable, sandy, silty, pebbly material which does not vary greatly in its makeup from one place to another. This sort of till, together with the sandy or silty outwash that has filled the depressions, is a desirable parent soil material. The silty blanket covering this part of the county, as previously mentioned, is a further desirable feature. Since these materials are readily penetrated by air and water, they permitted the relatively rapid action of solution, leaching, oxidation, and other soil-forming processes, and as a result the soils in the southern part of the county are in a later stage of development than those in the northern part.

The till of the northern half of the county, on the contrary, is extremely variable. To the east and north of Rossville, as well as along most of the east county line north from Danville, the till is pebbly, friable, and permeable. Northwest from Rossville to beyond Rankin it is irregularly but progressively more compact, plastic, and impermeable. In the remainder of this part of the county it is intermediate in character, being compact and medium plastic, with moderately slow permeability. Because of this resistance to the ready penetration of air and water, and consequent slower action of the agencies of weathering, the soils around Rankin are shallower and the unweathered till lies near enough to the surface to be harmful.

Vegetation started to grow following the melting back of the ice sheet, and the soil materials left by the glacier were gradually changed into soils. The low-lying wet areas were favorable for a heavy growth of swamp grasses and the accumulation of large amounts of organic matter. Fresh-water shell-bearing organisms lived in some of these areas, and their shells accumulated in considerable quantities. The present-day soils in these low-lying areas are the mucks and black clay loams. On the adjoining more rolling lands conditions were favorable for only a fairly good growth of prairie vegetation but not so favorable for the preservation and accumulation of large amounts of organic matter as were the

lower, wetter areas. The soils developed on these areas are the brown and light brown silt loams and sandy loams.

Along Vermilion river and its tributaries forest vegetation gradually worked its way into the prairie land. This continued until stopped by the clearing and tilling operations of the white man. The soils on the areas covered by timber became light colored as timbered soils do, because tree and brush vegetation produces conditions which accelerate the destruction of organic matter and the forest residue decays too fast to add much organic matter to the soil to replace that lost

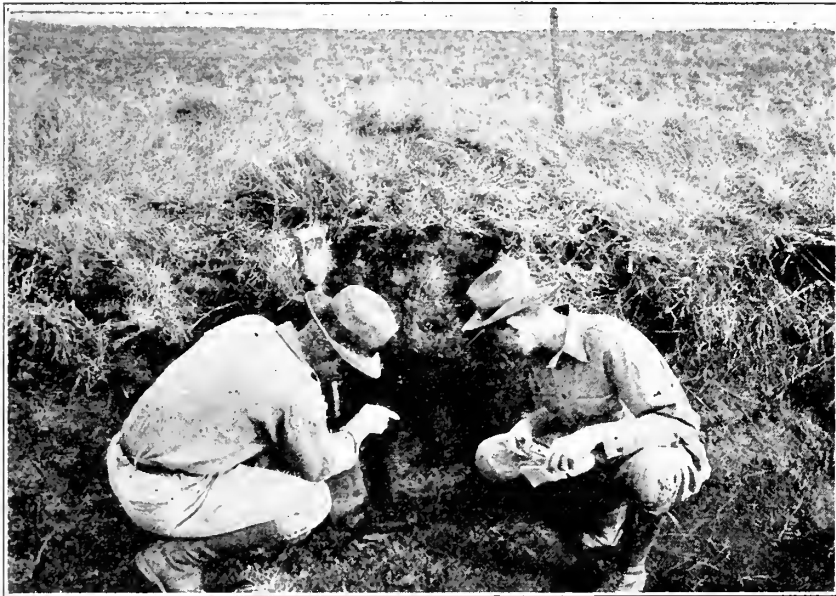


FIG. 3.—STUDYING THE SOIL PROFILE

One of the very pronounced characteristics observed in most soils is that they are composed of more or less distinct layers, or strata, often spoken of in soil literature as "horizons." The vertical section of the soil displaying the arrangement of these horizons from the surface down is called the "soil profile."

by decomposition. The present-day soils that occupy these areas are light colored compared with the soils which were developed under a grass vegetation.

Another pronounced and universal effect of the weathering of soil material into soil is the production of layers, or horizons, each horizon having more or less definite characteristics. From a practical standpoint these various horizons can be grouped into surface, subsurface, and subsoil. The *surface* is usually the layer of greatest organic-matter accumulation. In young soils the *subsurface* is generally a zone of gradation between the surface and subsoil, but in old soils it may be a bleached, highly weathered layer entirely different from either the horizon above or below. The *subsoil* is the zone of greatest clay accumulation, and consequently is more plastic and sticky than either the material above or below it. This condition becomes more pronounced as soil development proceeds. All of these zones or horizons taken together constitute the "soil profile"; and differences in the arrangement, in the thickness, and in the nature of the respective horizons constitute the basis upon which soil types are differentiated and the soil map is constructed.

SOIL CLASSIFICATION AND MAPPING

In the soil survey the "soil type" is the unit of classification. Each soil type has definite characteristics upon which its separation from other types is based. These characteristics are inherent in the strata, or horizons, which constitute the soil profile in all mature soils. Among them may be mentioned color, structure, texture, and chemical composition. Topography, as well as kind and character of vegetation, are easily observed features of the landscape which are very useful indicators of soil character. A knowledge of the geological origin and formation of the soil material of a region often makes possible an understanding of the soil conditions that exist.

TABLE 1.—VERMILION COUNTY SOILS: AREAS OF THE DIFFERENT TYPES

Type No.	Type name	Area in square miles	Area in acres	Percent of total area
22	Westville silt loam.....	1.86	1 190	.21
23	Blount silt loam.....	54.20	34 688	6.11
25	Eroded Calcareous Gravelly Loam (Hennepin gravelly loam).....	38.02	24 333	4.28
55	Sidell silt loam.....	4.63	2 963	.52
67	Harpster clay loam.....	8.28	5 299	.93
73	Huntsville loam, bottom.....	32.58	20 851	3.67
81	Littleton silt loam, terrace.....	1.68	1 075	.19
87	Sumner sandy loam, terrace.....	4.21	2 694	.48
103	Muck.....	.07	45	.01
134	Camden silt loam, terrace.....	3.83	2 451	.43
135	Potomac sandy loam, terrace.....	1.64	1 050	.18
141	Leeds sandy loam.....	6.20	3 968	.70
144	Alvin sandy loam.....	3.23	2 067	.36
146	Elliott silt loam.....	172.16	110 182	19.42
146M	Mixed Elliott silt loam and Clarence silt loam	48.89	31 290	5.51
147	Clarence silt loam.....	13.73	8 787	1.54
149	Brenton silt loam.....	91.53	58 579	10.33
150	Onarga sandy loam.....	1.11	710	.12
152	Drummer clay loam.....	240.02	153 613	27.08
156	Ridgeville sandy loam.....	2.78	1 779	.32
157	Rankin sandy loam.....	10.78	6 899	1.21
158	Vance silt loam.....	71.24	45 594	8.04
159	Pilot silt loam.....	3.21	2 055	.36
171	Catlin silt loam.....	63.09	40 378	7.22
172	Myersville sandy loam, terrace.....	1.96	1 255	.22
	Mine dump, strip mine, stone quarry, water..	4.96	3 175	.56
	Total.....	885.89	566 970	100.00

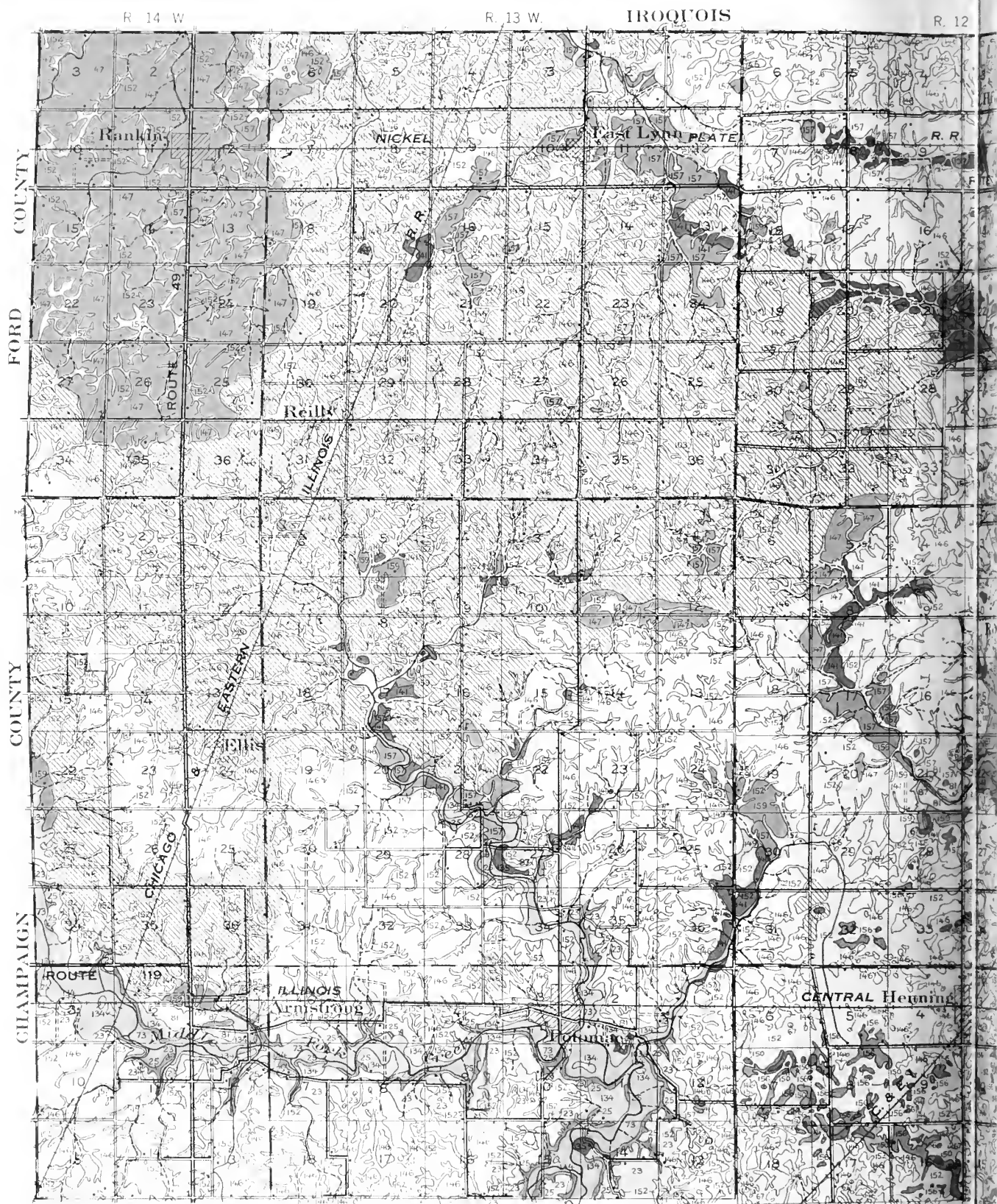
Failure to appreciate the fact that soil types are differentiated on the basis of the character of the entire soil section, and not on the surface alone, often makes it difficult to understand what is meant by soil type. It frequently happens that the surface stratum of one soil type is no different from that of another, and yet the two types may be widely different in character as well as in agricultural value. It is therefore of utmost importance in studying descriptions of soil types to get a clear mental picture of all of the outstanding features of each type.

To assist in designating soil types, a number is assigned to each type. These numbers are not only a convenience in referring to the respective types but they are especially useful in designating small soil areas on the map.

VERMILION COUNTY SOIL MAP

THE LOCATION of each soil type in Vermilion county is indicated on this map (consisting of three sections). The positions of streams, roads, railroads, and towns also are shown in order to help one in locating a particular farm or region. A distinctive color and a number are used to identify each type.

For a description of each type and a statement of its best use and recommended management, see pages 14 to 35, consulting *Contents*, page 2, for exact page references.



R. S. Smith, In Charge Soil Survey
E. A. Norton, Inspector

SOIL SURVEY MAP OF VERMILION UNIVERSITY OF ILLINOIS AGRICULTURAL EXPERIMENT STATION

CONVENTIONAL SIGNS

- | | | | |
|----------|-----------------------|--------------------------------------|-----------------------|
| • House | ▲ Store building | --- Railroads (electric) | Public roads |
| • School | --- Elevator | == Paved roads (through route) | Private roads |
| • Church | --- Railroads (steam) | --- Public roads (improved all year) | --- Township boundary |

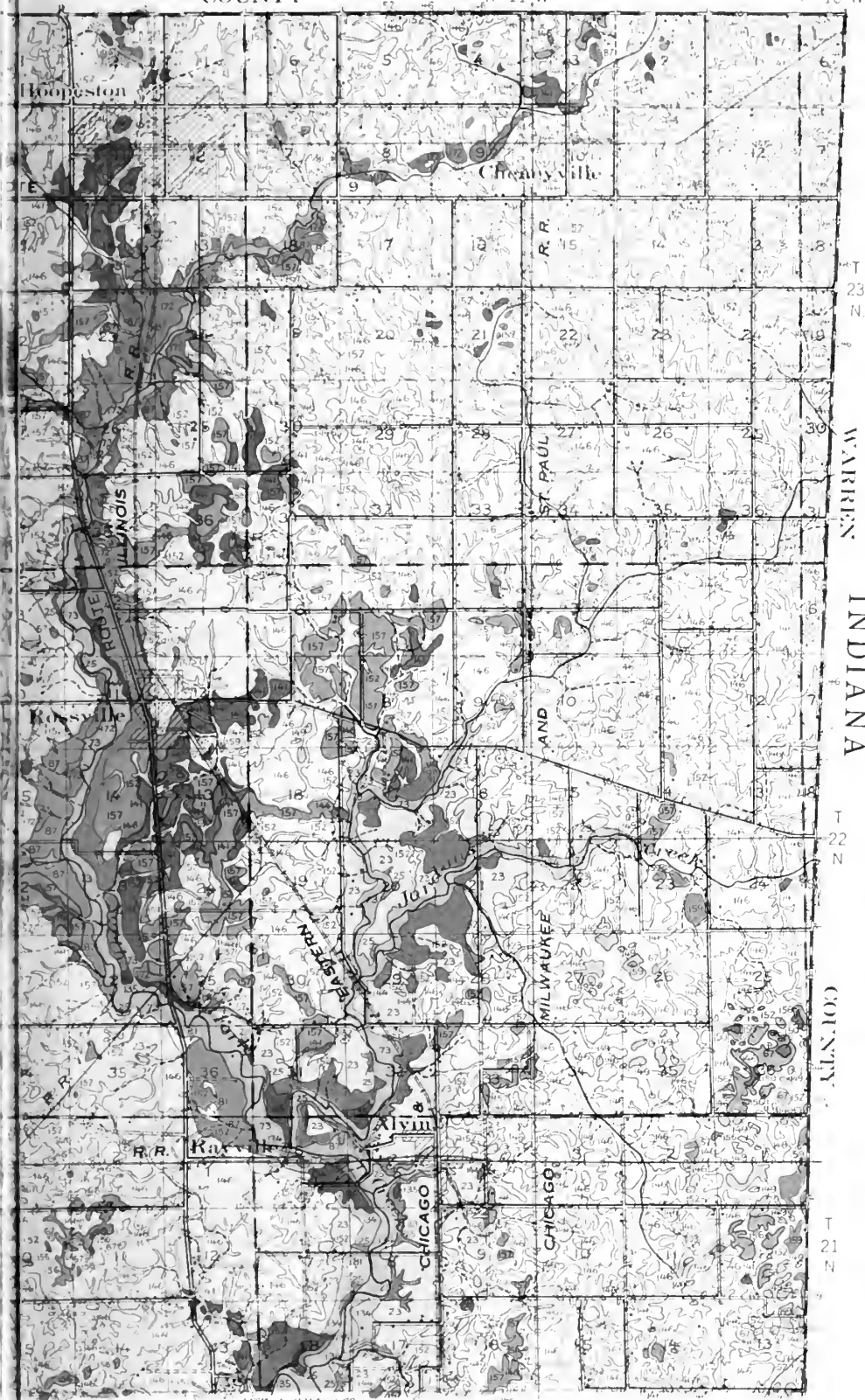
COUNTY

R 11 W

R 10 W

LEGEND

- 22 Western silt loam
- 23 Brunt silt loam
- 25 Eroded Calcareous Gravelly loam
- 55 Sidel silt loam
- 67 Harpster clay loam
- 73 Huntsville loam, bottom
- 81 Littleton silt loam terrace
- 87 Summer sandy loam, terrace
- 103 Muck
- 134 Camden silt loam, terrace
- 135 Potomac sandy loam terrace
- 141 Leeds sandy loam
- Alvin sandy loam
- 146 Elliott silt loam
- 146 Mixed Elliott silt loam and Clarence silt loam
- 147 Clarence silt loam
- 149 Brenton silt loam
- 150 Onarga sandy loam
- 152 Drummer clay loam
- 156 Ridgville sandy loam
- 157 Rankin sandy loam
- 158 Vandalia silt loam
- 159 Piquette loam
- 171 Galesburg silt loam
- 172 Myersville sandy loam, terrace



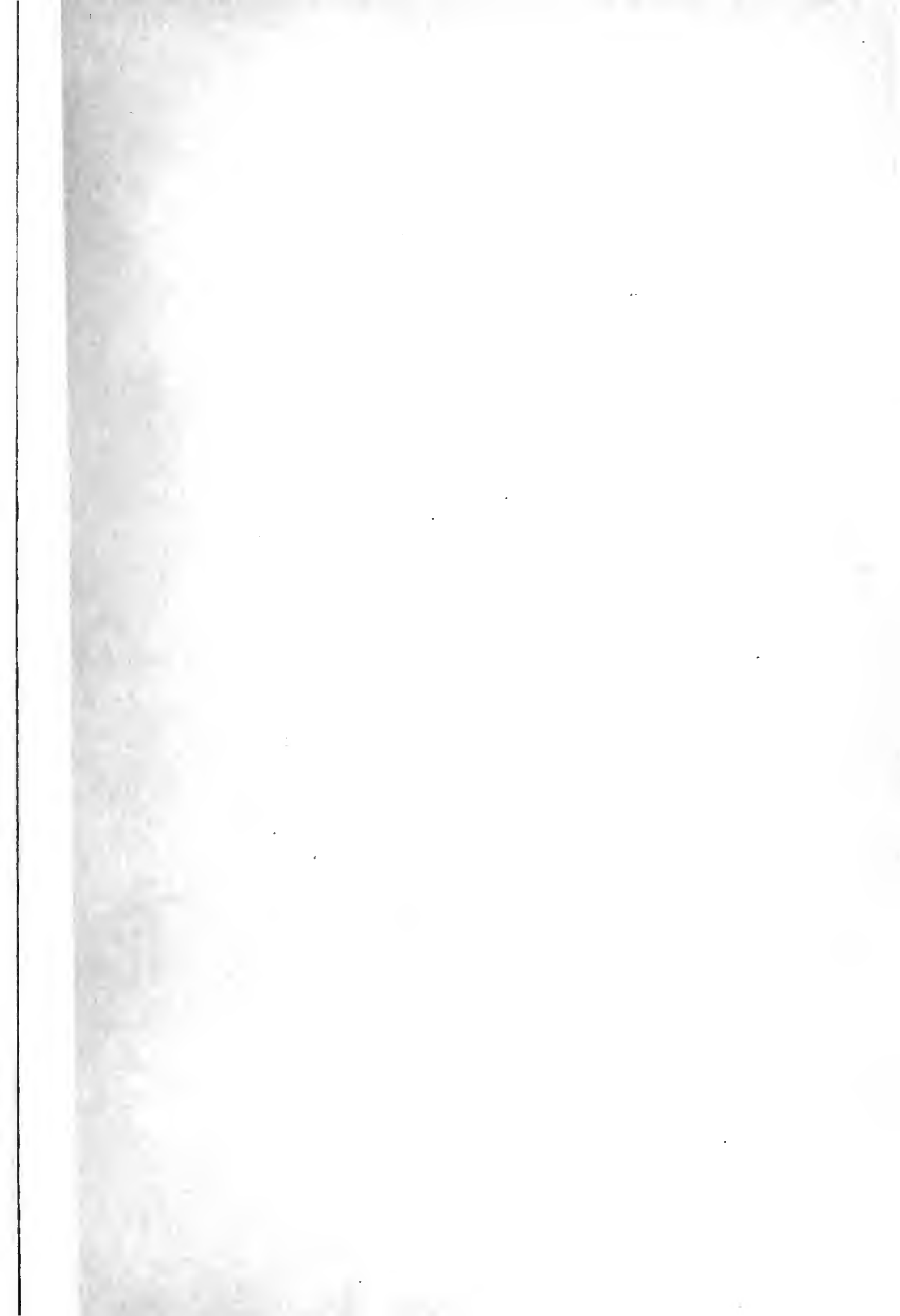
ON COUNTY
VERIMENT STATION

Soils Surveyed by
Herman W. Scher, in Charge
Eric Winters, Jr.
M. B. Harland

Scale
0 1 2 Miles
1932

- County boundary lines
- Streams (intermittent)
- Gravel pits
- State boundary lines
- Fords (river)
- Mine dump
- Strip mine
- Streams (flowing)
- Lakes or ponds





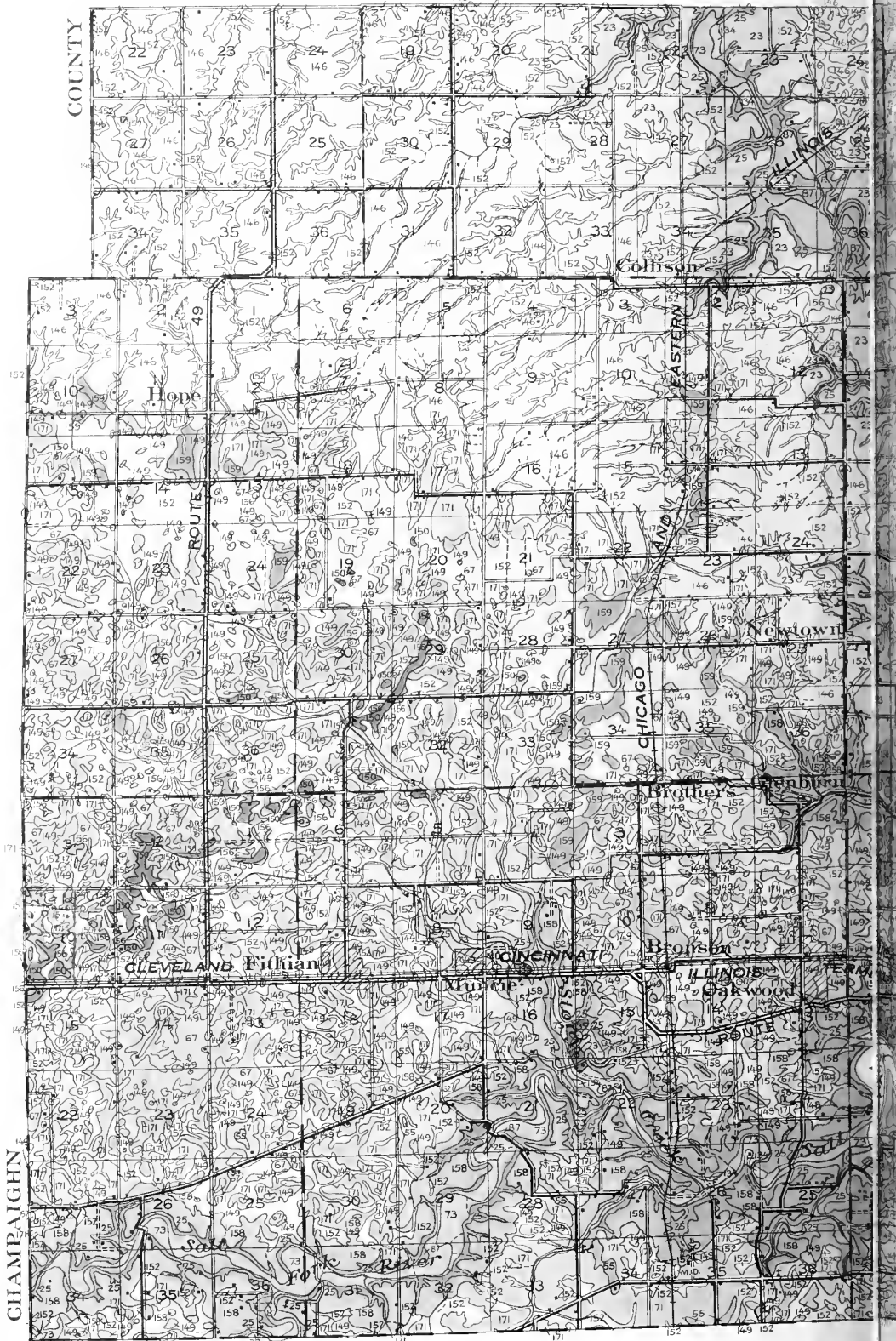
LEGEND

R. 14 W.

R. 13 W.

COUNTY

- 22 Westville silt loam
- 23 Blount silt loam
- 25 Eroded Calcareous Gravelly Loam
- 55 Sidell silt loam
- 67 Harpster clay loam
- 73 Huntsville loam, bottom
- 81 Littleton silt loam, terrace
- 87 Sumner sandy loam, terrace
- 103 Muck
- 134 Camden silt loam, terrace
- 135 Potomac sandy loam, terrace
- 141 Leeds sandy loam
- 144 Alvin sandy loam
- 146 Elliott silt loam
- 146 Mixed Elliott silt loam and Clarence silt loam
- 147 Clarence silt loam
- 149 Brenton silt loam
- 150 Onarga sandy loam
- 152 Drummer clay loam
- 156 Ridgeville sandy loam
- 157 Rankin sandy loam
- 158 Vance silt loam
- 159 Pilot silt loam
- 171 Catlin silt loam
- 172 Myersville sandy loam, terrace

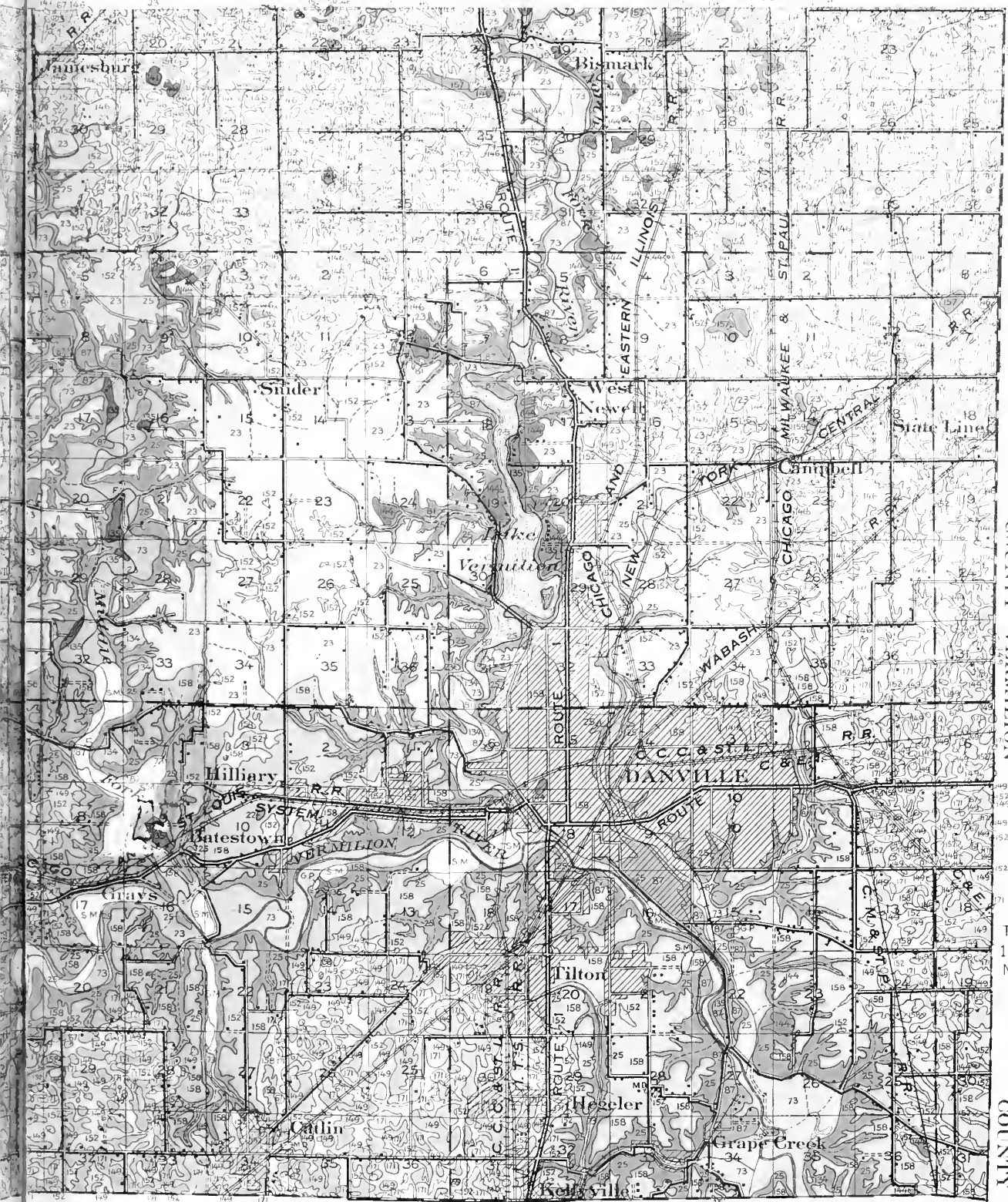


R. S. Smith, In Charge Soil Survey
E. A. Norton, Inspector

SOIL SURVEY
UNIVERSITY OF ILLINOIS

Scale
0 1/2 1 2 Miles
1932

- House
- ▲ Store building
- Railroads (electric)
- School
- Elevator
- == Paved roads (through route)
- Church
- Railroads (steam)
- == Public roads (improved - all year)



WARRENT 21 N
T. 20 N.
COUNTY VERMILION
T. 19 N.
COUNTY

LITH. A. HOEN & CO.

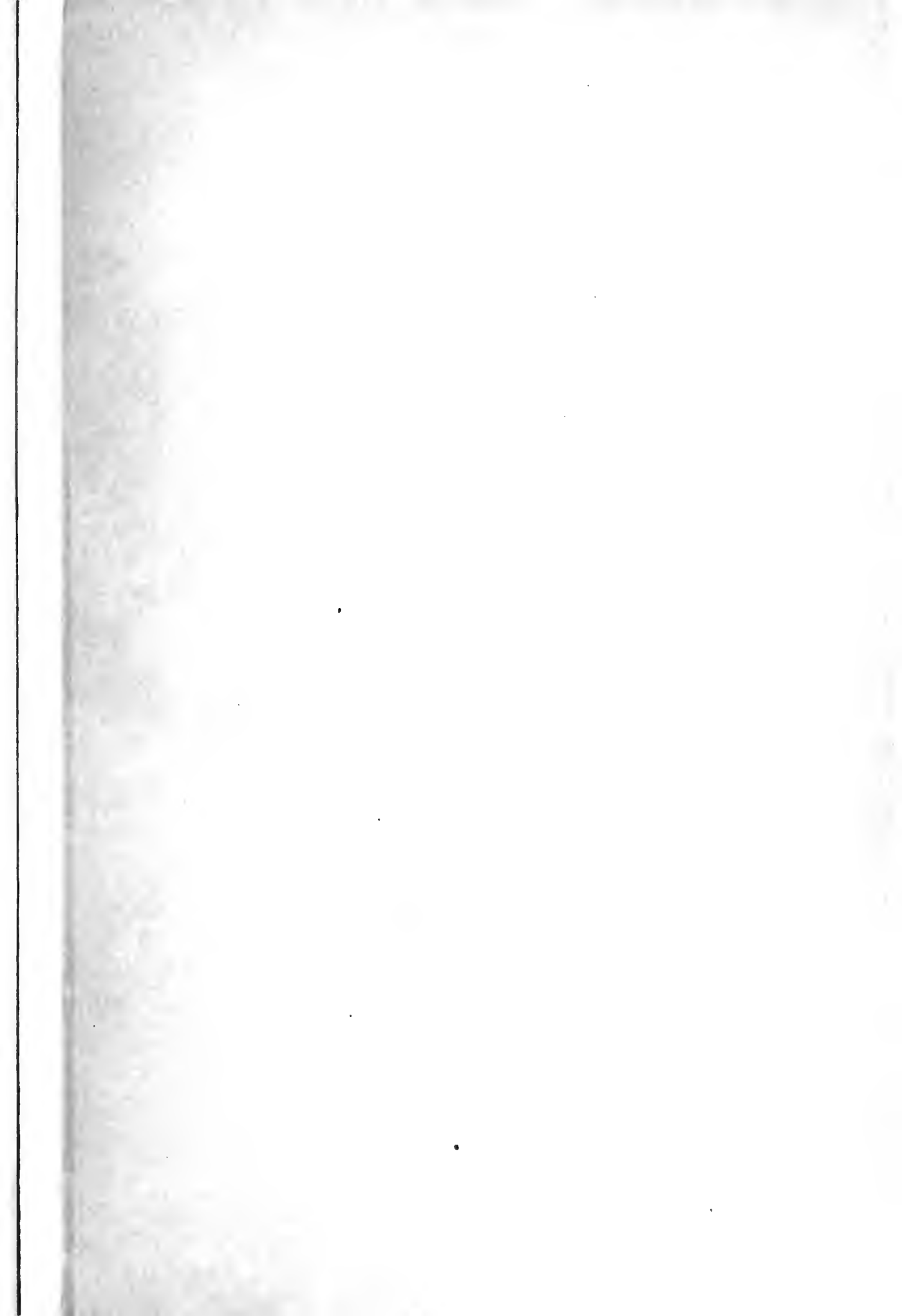
MAP OF VERMILION COUNTY S AGRICULTURAL EXPERIMENT STATION

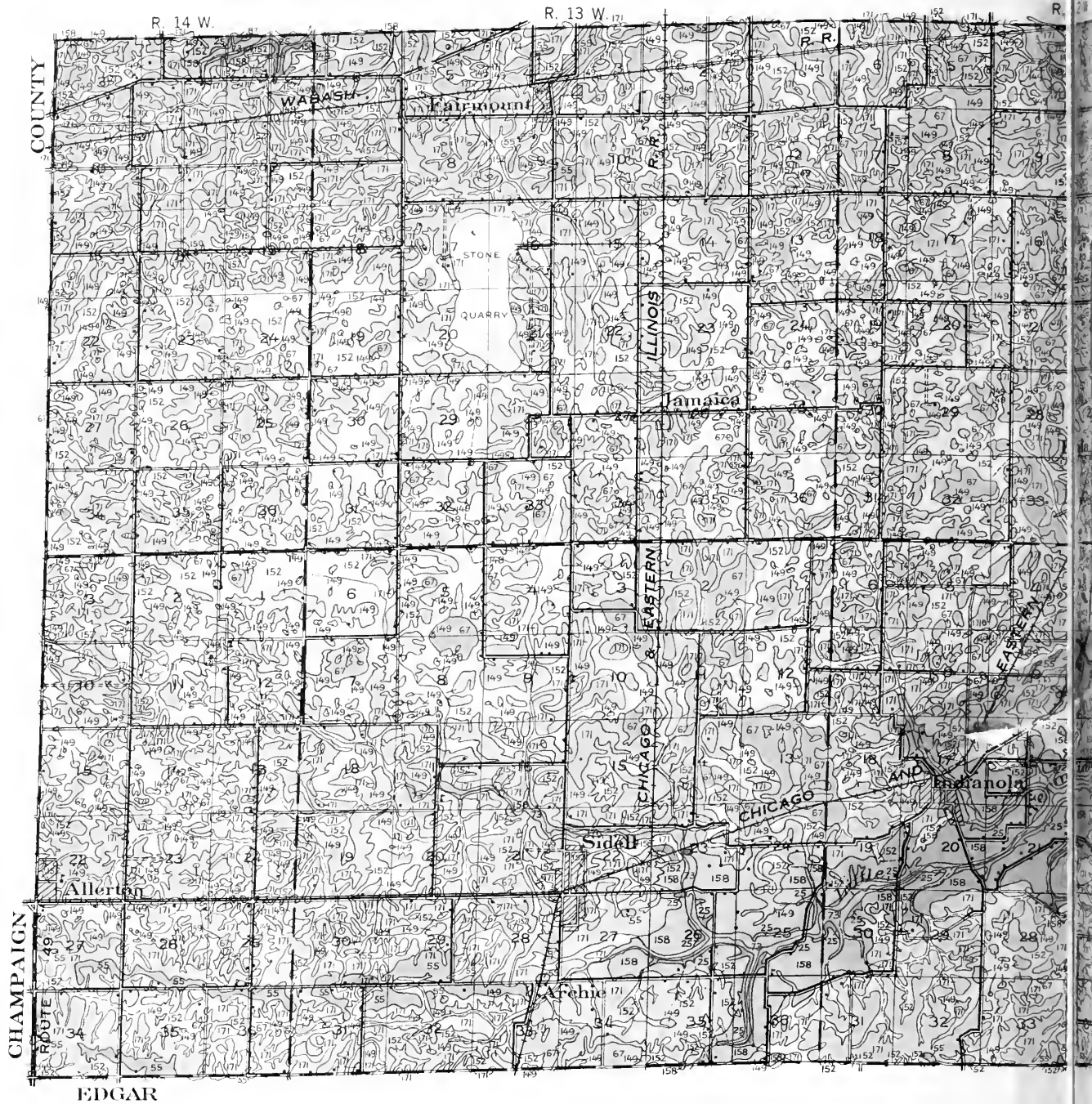
Soils Surveyed by
Herman Wascher, in Charge
Eric Winters, Jr.
M. B. Harland

CONVENTIONAL SIGNS

- | | | | |
|-----------------------------------|-----------------------------|------------------------|-------------|
| Public roads | -- County boundary lines | Streams (intermittent) | Gravel pits |
| Private roads (poor - impassable) | -- State boundary lines | F Fords (river) | Mine dump |
| Township boundary lines | - - - - - Streams (flowing) | Lakes or ponds | Strip mine |







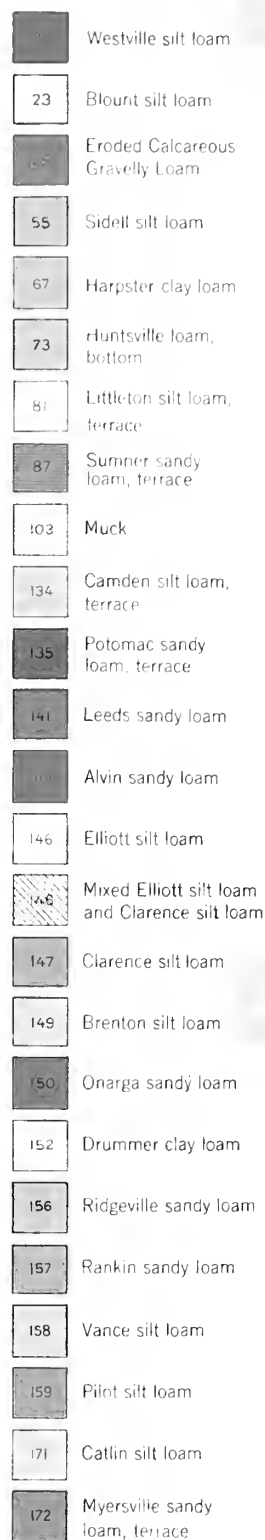
Soils Surveyed by
Herman Wascher, in Charge
Eric Winters, Jr.
M. B. Harland

SOIL SURVEY MAP OF VERMILION COUNTY, ILLINOIS

UNIVERSITY OF ILLINOIS AGRICULTURAL EXPERIMENT STATION

CONVENTIONAL SIGNS

- | | | |
|------------------|----------------------------------|--|
| • House | —•— Elevator | ==== Public roads (improved - all seasons) |
| ⌘ School | —+— Railroads (steam) | ==== Public roads |
| ⌘ Church | —+— Railroads (electric) | ===== Private roads (poor - impassable) |
| ▲ Store building | ==== Paved roads (through route) | — Township boundary lines |



R S. Smith, In Charge Soil Survey
E A Norton, Inspector

ON COUNTY
EXPERIMENT STATION










- | | | | |
|---|------------------------|---|----------------|
|  | County boundary lines |  | Fords (river) |
|  | State boundary lines |  | Lakes or ponds |
|  | Streams (flowing) |  | Gravel pits |
|  | Streams (intermittent) |  | Mine dump |
| | |  | Strip mine |

Table 1 gives the list of soil types as mapped in Vermilion county, the area of each in square miles, as well as in acres, and also the percentage that each type constitutes of the total area of the county. The accompanying soil map, shown in three sections, gives the location and boundary of each soil type and indicates the position of streams, roads, railroads, towns, rural schools, dwellings, and other features as shown on the legend.

SOIL TYPES OF VERMILION COUNTY: THEIR USE, CARE, AND MANAGEMENT

There are twenty-five soil types shown on the Vermilion county soil map. Of these twenty-five types, ten constitute 93 percent of the total land area in the county; each of the other fifteen accounts for about 1 percent or less, being for the most part terrace types. A brief description of the outstanding characteristics, together with some general recommendations on the use, care, and management of each type as mapped in Vermilion county, is given in the following paragraphs. Part of this information is summarized in Table 2.

Scope of Use and Management Recommendations.—The recommendations made for the utilization of the various soil types is based on their inherent capacity for efficient production. Such matters as the growing of special crops, the location of the land with respect to markets, and other economic considerations have not ordinarily been taken into account.

To outline a complete soil-improvement and management program for a field or farm, one would need to know not only what soil types are included but also what cropping and management practices have been followed in the past, as well as what type of farming is intended to be followed in the future. Obviously all these details are not available. In this report, therefore, it is possible to indicate for each type only the main factors that should be considered in developing a soil-treatment and management program. The necessity of recognizing the soil type as the unit for a soil-improvement program is illustrated by the difference between the drainage and erosion problem of Clarence silt loam and that of Brenton silt loam. If tile are placed in Clarence silt loam, they will draw the excess soil water from only a few feet on each side of the tile line and then only very slowly. Consequently a system of surface drainage, including protection against erosion, is necessary to take care of excess water in this soil. In Brenton silt loam, on the other hand, tile draw very well and need only a good outlet with sufficient fall to remove the excess soil water. Also, erosion is negligible in Brenton silt loam and probably need never be considered in a management plan for this soil.

Simple Soil Tests Useful in Improvement Programs.—As an aid in determining differences in the degree of acidity in soils and in their content of some of the essential plant-food elements, certain relatively simple and rapid chemical tests have been devised. It is recommended that these tests be made on fields where treatment to increase productivity is being planned. The tests are explained in the following publications of this Station:

Circular 346—Test Your Soil for Acidity
Circular 421—Testing Soil for Available Phosphorus
Mimeographed folder—The Illinois Potash Test

Other publications which will be referred to from time to time in the “use and management” discussions of the individual soil types are:

Circular 459—Terraces to Save the Soil
Circular 465—Pasture Improvement and Management
Bulletin 394—Sweet Clover in Illinois
Bulletin 425—Crop Yields from Illinois Soil Experiment Fields

These, as well as other publications of this Station, may be obtained free of charge on request to the Agricultural Experiment Station, University of Illinois, Urbana, Illinois.

Westville silt loam (22)

Westville silt loam is a light-colored soil developed on rolling topography under a deciduous forest vegetation. It occurs on the remnants of an old morainal ridge in the southeastern part of the county and occupies an area of 1.86 square miles, or .21 percent of the total area of the county.

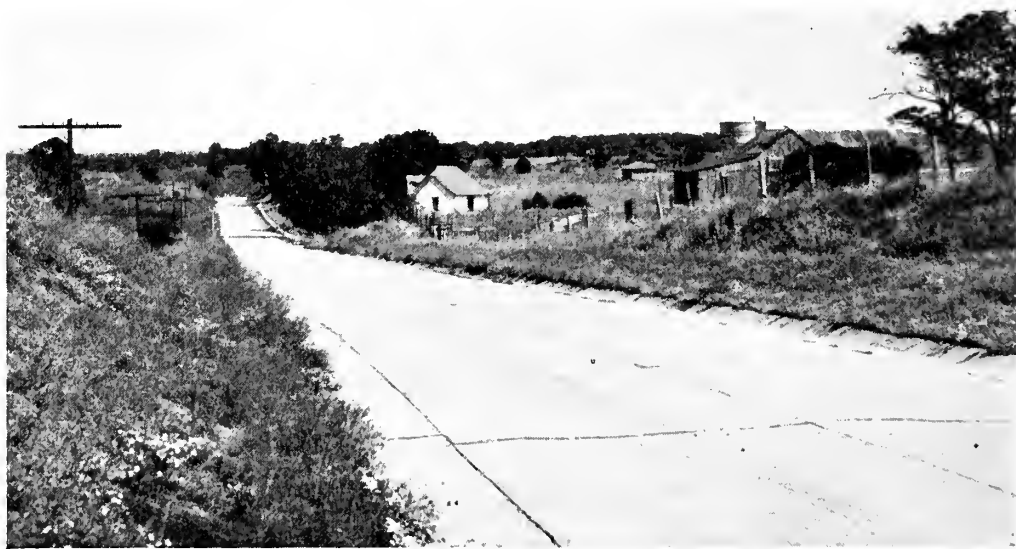


FIG. 4.—A CHARACTERISTIC VIEW OF A WESTVILLE SILT LOAM AREA

Note the rolling surface. The first step in a general soil-improvement program for this relatively infertile type is the adoption of practices that will retard erosion.

The surface horizon is a yellowish-gray silt loam about 5 to 7 inches thick. In undisturbed forested areas the upper 2 or 3 inches of this horizon is dark gray or brownish-gray owing to a higher organic-matter content. The sub-surface is 6 to 8 inches thick and is a grayish-yellow silt loam. The subsoil is 12 to 14 inches thick and is a yellow or pale reddish-yellow medium-plastic silty clay loam that breaks into $\frac{1}{4}$ - to $\frac{3}{4}$ -inch subangular aggregates with brownish-gray coatings. At a depth of 25 to 30 inches there is often a few inches of yellowish silty material, below which lies a brownish leached sandy gravelly

clayey till. Sometimes the silty horizon is absent and the subsoil tends to merge directly with the brownish coarse underlying material. Below 40 to 45 inches the till is usually calcareous, tho in places the lime is leached to greater depths.

Use and Management.—Westville silt loam in Vermilion county occurs on slopes varying in grade from 6 to 12 percent. Surface drainage is rapid and underdrainage is moderate. The loss of surface material by erosion is a serious problem; consequently any fields in which this soil occurs should be protected by a vegetative cover as much of the year as possible, particularly in the winter and early spring months. Fall plowing should always be avoided. Contour tillage should be practiced; and strip cropping, where it can be used successfully, will prove valuable. If used for permanent pasture, close grazing should be avoided and a good growth of grass should be encouraged by proper fertilizer treatment, as suggested in Circular 465.

Tho this is a relatively infertile soil, it will respond to good treatment and can be made to produce satisfactory crop returns. The first step in a general soil-improvement program is the adoption of practices that will retard erosion. A crop rotation should be introduced in which some leguminous green-manure crop occurs every three or four years. In order to secure a satisfactory stand of the legume, especially of sweet clover or alfalfa, a small amount of limestone, and perhaps a phosphatic fertilizer, will need to be applied. This will involve testing the soil for acidity and available phosphorus, as described in Circulars 346 and 421. Regular applications of barnyard manure will help to maintain the producing capacity of this soil.

Blount silt loam (23)

Blount silt loam is a light-colored soil that has developed on gently rolling to rolling topography under a deciduous forest vegetation and where the underlying glacial till is slowly permeable and calcareous. It occurs along the streams in the north half of the county and occupies an area of 54.2 square miles.

The surface is normally 5 to 8 inches thick and is a yellowish-gray to a grayish-yellow silt to fine sandy silt loam. In undisturbed forest areas the upper 2- to 3-inch layer is brownish gray in color. The subsurface is 5 to 7 inches thick and is a grayish-yellow silt loam. The subsoil varies from 12 to 18 inches in thickness, the upper 8 or 10 inches being a brownish-yellow compact and medium-plastic clay loam or silty clay loam which breaks into $\frac{1}{4}$ - to $\frac{1}{2}$ -inch aggregates with brownish-gray coatings. Below the subsoil is usually a zone of structureless yellow-and-gray compact and medium-plastic gritty leached till which grades into compact and highly calcareous till at a depth of 35 to 40 inches.

Use and Management.—Since in this county the surface slope of Blount silt loam is rather variable, treatment must necessarily vary also. The subsoil and the underlying glacial till are both moderately compact and plastic; consequently underdrainage is slow and tile will not draw readily. This means that where slopes greater than 3 or 4 percent occur in a field under cultivation, precautions must be taken to reduce erosion by the use of cover crops, contour tillage and, if possible, by strip cropping. Fall plowing should be avoided.

Ordinarily this is not a productive soil. A few excellent crops may be produced following removal of the timber cover, but crop yields drop rapidly with

continued cultivation. However, areas that are not ponded and not too poorly drained, or not too steeply sloping and badly eroded, respond favorably to good treatment. Regular additions of fresh organic matter are one of the essential features of a well-planned soil-improvement program for this soil type. Use should be made of some leguminous green-manure crop, preferably sweet clover supplemented by a barnyard manure where available. Testing the soil for acidity, as described in Circular 346, and applying limestone as suggested, is recommended before attempting to grow sweet clover. Bulletin 394 will be helpful in understanding the requirements and methods of handling this crop. Increased acreages of alfalfa on this soil are advisable. Blount silt loam makes reasonably good permanent pasture land, but in establishing a permanent pasture, limestone should be applied, and if phosphate is also applied a better grass growth will be secured.

Eroded Calcareous Gravelly Loam (25)

(Now known as Hennepin gravelly loam)

Eroded Calcareous Gravelly Loam occurs on the steep bluff land along the stream valleys, including also gullies that have cut into the uplands. It occupies an area of practically 38 square miles.

Destructive erosion has followed the removal of the tree and brush vegetation from the steep slopes occupied by this soil, resulting in the loss of much soil material. In badly eroded areas, such as freshly cutting gullies, the calcareous pebbly till is often exposed. However, in an uncleared virgin area the yellowish-gray surface is usually 3 to 5 inches thick, which includes 1 or 2 inches of dark decaying leaf mold. The subsurface is yellow or reddish yellow and is usually



FIG. 5.—AN AREA OF ERODED CALCAREOUS GRAVELLY LOAM LARGELY CLEARED OF TREES

This hillside might be producing valuable timber rather than lying exposed to destructive erosion. Compare this picture with Fig. 6.



FIG. 6.—A FAIRLY HEAVILY TIMBERED AREA OF ERODED CALCAREOUS GRAVELLY LOAM

Trees have been left to grow on this hillside. Such land can be protected from destructive erosion by judicious forestation, and at the same time a valuable crop of timber can be produced. Compare this picture with Fig. 5.

2 to 4 inches thick. The subsoil is 8 to 10 inches thick and is a reddish-yellow to yellow pebbly clay loam.

Use and Management.—Because this type usually occurs on slopes of 25 percent or greater and is so easily damaged by erosion, its best use is for timber. On areas already cleared and injured the problem is to get some sort of protective vegetation started. Sweet clover and young locust trees are probably two of the most satisfactory plants for this purpose, tho considerable difficulty may be experienced in getting either started, especially if gully head-cutting is not at least partially stopped. The use of a temporary check dam is sometimes advisable, or a diversion terrace along the brow of the slope may be helpful. Circular 459 tells how to construct such a terrace. Following sweet clover and the checking of erosion, bluegrass will come in or permanent plantings of desirable forest trees can be made.

Sidell silt loam (55)

Sidell silt loam is a medium-dark soil developed on rolling topography under a prairie-grass vegetation. It occurs on the higher knolls and ridges in the southern part of Vermilion county and occupies 4.63 square miles, which is only one-half of one percent of the area of the county.

The surface is 6 to 8 inches thick and is a brown to light-brown silt loam. In certain areas pebbles are abundant on the surface. The subsurface is 6 to 8 inches thick and is a light-brown or yellowish-brown silt loam which in the lower part

begins to show faint subangular structure. The subsoil varies from 12 to about 20 inches in thickness and is a brownish-yellow to reddish-yellow slightly plastic silty clay loam which breaks into $\frac{1}{8}$ - to $\frac{1}{2}$ -inch subangular aggregates. Only infrequently can a dark coating on the cleavage faces be noticed. The aggregates gradually enlarge and tend to disappear with increasing depth until at 28 to 34 inches the material is a slightly plastic sandy, silty, or pebbly leached till of a brownish-yellow color or yellow mixed with gray, usually having an abundance of brown iron spots and splotches. The till may become calcareous at 40 to 45 inches beneath the surface but more often it does not do so until a somewhat greater depth is reached.

Use and Management.—The surface slopes of Sidell silt loam range in grade from 6 to about 12 percent so that the surface runoff is rapid and erosion is a serious problem. Underdrainage is moderate thruout the .type. Any cultivated fields in which this soil type occurs should be protected by some vegetative cover as much of the year as possible, particularly during winter and early spring.



FIG. 7.—EROSION IS A SERIOUS PROBLEM ON SIDELL SILT LOAM

Cultivated fields on this soil type should be protected by a vegetative cover as much of the time as possible, and other measures should be taken that will protect the land against erosion.

Altho this is not a very productive soil, it responds satisfactorily to proper treatment. The first task in a good soil-treatment and management program should be to reduce erosion to a minimum. This may be accomplished by farming on the contour, strip cropping, and using cover crops. Perhaps a certain amount of terracing in some fields will be advisable. Circular 459 will prove helpful in terrace construction. Any mechanical means used to control erosion should be accompanied by soil management and treatment that will produce a vigorous vegetative growth. Animal manure should be utilized wherever available; limestone and phosphate should be applied where the tests outlined in Circulars 346 and 421 indicate a need for them; and legumes should be grown frequently. Fall plowing should be avoided on this soil because it accelerates erosion losses.

Harpster clay loam (67)

Harpster clay loam is a dark soil that has developed in nearly level to depressional, partially submerged areas where swamp grass or slough grass once grew luxuriantly and where innumerable snails or other small shell-bearing organisms developed. As a rule the type occurs as very small tracts, but these small tracts may be so numerous in some places as to constitute the predominating type over an area many acres in size. A total area of 8.28 square miles is occupied by this type, which occurs chiefly in the west central and southwestern parts of the county.

Harpster clay loam has no well-defined soil horizons. The surface varies from a black, grayish-black, or grayish-brown silty clay loam to a clay loam and contains numerous calcareous shell fragments. The subsurface is more plastic, usually containing many shell fragments. The subsoil is a drab or gray clay loam often containing shell fragments and lime concretions. Below plow depth the shells, tho more or less fragmentary, tend to remain undisturbed and are often surrounded by yellowish splotches. The underlying material usually varies from a yellow and gray-spotted silt or sandy silt to a coarse sand or gravel similar to that found under the related outwash types.

Use and Management.—Good drainage is the first essential in the successful management of this type. Surface drainage is normally rather slow, but under-drainage is moderate and tile draw satisfactorily provided an outlet with sufficient fall is secured. This soil is not adapted to the small grains because of their tendency to lodge. It is a good corn soil, but many areas require applications of potash or straw or strawy manure to counteract the toxic effects of the high soluble-salt content when corn is grown. Lime should not be applied, as it is already present in excess.

Huntsville loam, bottom (73)

Huntsville loam, bottom, occupies all the bottomlands in the county and covers a total area of 32.58 square miles, or 3.67 percent of the county.

This type is subject to frequent overflow. It is made up of rather recently deposited sediments and shows no very definite profile development. For the most part, however, the surface is brown to grayish brown in color, 6 to 12 inches thick, and of a silty or sandy texture. Below the surface the material is usually brownish yellow to brownish gray in color and is made up of strata of clay, silt, and sand or gravel. Sand and gravel bars are numerous along the small side-streams, while deposits of silt and clay predominate in the larger bottoms.

Use and Management.—The occurrence of this type in irregular areas, as well as the danger of seasonal flooding, tends to limit its usefulness. Many of the smaller bottoms are crooked and narrow, being 40 rods or less in width. This, together with the fact that the streams commonly cross and recross their bottoms, makes for unsatisfactory cultivation. Consequently many of these bottoms and their adjoining bluff lands are used for pasture. The larger bottoms, on the other hand, are more easily tilled and usually produce good crops of corn, oats, or soy-beans when not damaged by flood. Wheat is sometimes grown, but the danger of overflow limits the usefulness of bottomlands for winter crops.

Some of the bottomlands have been strip-mined. After removal of the coal,



FIG. 8.—TYPICAL VIEW OF HUNTSVILLE LOAM

Huntsville loam occupies all the bottomland of Vermilion county. This picture shows a spot in the western part of the county, along Salt Fork river, that was planted to soybeans.

the stripped portion has been left in ragged and unsightly heaps which are unfit for any agricultural use. These areas should be planted to forest as rapidly as possible. One area of about 830 acres of this soil type at the northwest edge of Danville has been utilized in the formation of the artificial Lake Vermilion.



FIG. 9.—LAKE VERMILION FORMED ARTIFICIALLY FROM NORTH FORK RIVER

Lake Vermilion covers 830 acres of Huntsville loam northwest of the city of Danville. It is a beautiful area and provides pleasure and recreation for the people of Danville and the surrounding country.



FIG. 10.—STRIP MINING DESTROYS THE LAND FOR CROP PRODUCTION

Much of the bottomland of Vermilion county is underlain with coal. After the land is strip-mined for coal, it is left in long unsightly heaps utterly ruined for agriculture of any kind except possibly for forestry. Such areas might be utilized by planting them to trees.

Littleton silt loam, terrace (81)

Littleton silt loam, terrace, is a dark-colored soil occurring on the broader terraces, usually in association with Sumner sandy loam, terrace, Type 87. It occupies only 1.68 square miles.

The surface is normally 6 to 8 inches thick and is a brown silt loam to sandy silt loam. The subsurface is usually slightly lighter brown in color and is also about 6 to 8 inches thick. The subsoil is ordinarily a yellowish-brown to reddish-brown medium-plastic gravelly clay loam that grades below 35 to 40 inches into a brownish-yellow loose sand or gravel which usually shows some stratification.

Use and Management.—Both surface drainage and underdrainage of Littleton silt loam, terrace, are moderate. Erosion is not serious and the soil ordinarily is not drouthy. It is not a particularly productive soil but responds readily to the use of manure. Tests for acidity and available phosphorus should be made, and limestone and a high phosphate fertilizer should be applied in the amounts suggested in Circulars 346 and 421. Following this, sweet clover or alfalfa should be grown and turned under at regular intervals. A trial application of potash with a corn crop is suggested as a means of determining the need for this material.

Sumner sandy loam, terrace (87)

Sumner sandy loam, terrace, is a medium-dark soil developed on undulating to gently rolling topography under prairie-grass vegetation. It occupies 4.21 square miles, which is about one-half of one percent of the area of Vermilion county.

The surface is a brown sandy loam varying from 6 to 14 inches in thickness, medium in organic-matter content, and medium acid in reaction. The subsurface,

if present, is a light-brown or yellowish-brown sandy loam. The subsoil is brownish-yellow to reddish-brown medium-plastic sandy clay loam, often with a considerable amount of gravel, especially in the lower part. At 35 to 40 inches the material changes to stratified loose sand and gravel, which continues downward unchanged for many feet.

Use and Management.—Sumner sandy loam, terrace, is lower in organic matter and more acid than is Littleton silt loam, terrace, Type 81, with which it is often associated. It responds to a well-planned system of soil improvement. Tests for acidity and available phosphorus should be made as directed in Circulars 346 and 421, and these materials applied as indicated by the tests. A crop rotation, preferably a short one, which includes a legume crop for green manure, should be adopted. Sweet clover is one of the best legumes for this purpose; Bulletin 394 will be of considerable help in understanding the requirements and methods of handling this crop. This soil responds well to applications of barnyard manure.

Muck (103)

Muck is a very minor type in Vermilion county, occupying a total area of only about 45 acres. It is dark colored, high in organic matter and nitrogen, and neutral to alkaline in reaction. It occurs in small pond-like depressions that are not readily drained.

The surface is a mixture of well-decayed organic matter and mineral material. It is dark brown to black in color and varies from 1 to 2 feet or more in thickness. There is seldom a distinguishable subsurface or subsoil except that usually a grayish or drabish color is noticeable at a depth of 15 to 20 inches. Below 35 to 40 inches the material is of a friable and silty to sandy texture and is often highly calcareous.

Use and Management.—This soil grows good corn, but for best results it frequently needs to be treated with potash. It is not well suited to small grains.

Camden silt loam, terrace (134)

Camden silt loam, terrace, is found along the bottomland bordering the larger streams. It is a light-colored soil developed under forest vegetation on nearly level to undulating topography. It occupies 3.83 square miles.

The surface is a yellowish-gray silt loam to sandy silt loam low in organic matter and nitrogen and acid in reaction. It varies from 6 to 14 inches in thickness, depending upon the amount of slope wash from the adjacent uplands. The subsurface is 8 to 12 inches thick and is a pale grayish-yellow silt loam or fine, sandy silt loam. The subsoil is 8 to 14 inches thick and is a reddish-yellow medium-plastic silty to sandy clay loam that breaks into irregular 1/4- to 1/2-inch subangular aggregates. Below 30 to 40 inches the material becomes a yellow or brownish-yellow stratified loose sand or gravel which may extend 10 to 15 feet or more in depth.

Use and Management.—The surface drainage of Camden silt loam, terrace, is slow because of its nearly level topography, but the profile is permeable, giving

good underdrainage. The low organic-matter content of this soil limits its productivity; provision should be made for frequent additions of this important soil constituent by growing legumes. Sweet clover is probably the best source of fresh organic matter, but before attempting to grow it acidity tests should be made as directed in Circular 346 and the necessary amount of limestone applied. Animal manure gives excellent results on this soil, but there is rarely enough available to make it possible to do away with the regular growing of one of the clovers. With good farming Camden silt loam, terrace, is a fairly good general farm soil, but unless well farmed it does not produce well.

Potomac sandy loam, terrace (135)

Potomac sandy loam, terrace, is a light-colored sandy loam developed on undulating to gently rolling topography under forest vegetation. It occurs in small areas on terraces bordering the larger streams. It occupies only 1.64 square miles.

The surface is a grayish-yellow sandy loam low in organic matter and nitrogen and acid in reaction. In undisturbed forest areas the upper 2 or 3 inches is dark gray owing to an accumulation of organic matter from decaying leaves and twigs. The subsurface, if distinguishable, is a reddish-yellow to yellow incoherent sandy loam. The subsoil is a reddish-yellow slightly plastic clayey sandy loam that grades into stratified loose sand and gravel at 30 to 40 inches or deeper.

Use and Management.—This soil is naturally rather unproductive and requires careful handling to produce satisfactory yields. Some portions included within the type as mapped are drouthy. A good growth of alfalfa is sometimes secured on soils of this kind, tho it is necessary to apply limestone previous to seeding. Wheat or oats often do reasonably well when there is sufficient moisture during the spring growing months. Probably the best use for this soil, however, is forest or pasture.

Leeds sandy loam (141)

Leeds sandy loam is a dark-colored soil developed on nearly level to undulating topography under coarse prairie grass or slough grass vegetation. It occupies a total area of 6.20 square miles and is found best developed in the old drainage channels that at one time carried a large quantity of glacial water.

The surface is a brown to dark brown sandy loam high in organic matter and nitrogen and slightly acid in reaction. It varies from 7 to 15 inches in thickness owing in part to slope wash from adjacent higher land. The subsurface is a brown to light-brown sandy loam. The subsoil is a brown to brownish-yellow medium-plastic sandy clay loam which often contains some coarse sand or gravel, especially in the lower part. The subsoil usually grades at 35 to 40 inches into coarse loose sand or gravel; but where this type borders Elliott silt loam No. 146 it is sometimes underlain by compact calcareous till.

Use and Management.—Leeds sandy loam is a fairly productive soil if well handled. Both surface drainage and underdrainage are moderate. The water table is relatively high unless lowered by deep dredge ditches. Some of the heavier portions of the type will grow sweet clover without limestone, tho most of it

probably will not. An acidity test should be made of each field before seeding sweet clover for the first time. Tests should also be made for available phosphorus and potassium, as wheat and alfalfa will be greatly benefited by additions of a fertilizer high in phosphorus if this constituent is naturally low. If the test shows a low potassium content corn will be benefited by the addition of a potash fertilizer.

Alvin sandy loam (144)

Alvin sandy loam is a light-colored soil developed under forest vegetation on undulating to rolling topography. It occurs as a wind-deposited sand on the upland adjacent to Vermilion river and its North Fork. It occupies a total area of 3.23 square miles.

The surface is a grayish-yellow sandy loam low in organic matter and nitrogen and acid in reaction. In undisturbed forest areas the upper 2 or 3 inches is dark gray owing to an accumulation of decaying forest litter. The subsurface is a loose yellow sand. The subsoil usually shows a slight clay accumulation; otherwise it is a yellow or reddish-yellow loamy sand. The underlying material is a loose and incoherent yellow or reddish-yellow sand.

Use and Management.—Alvin sandy loam is not a very productive soil. However, after application of limestone and manure and growth of clovers, fair returns from certain crops may be obtained. Alfalfa grows satisfactorily, and the small grains do fairly well. It is questionable, however, whether any attempt should be made to use this soil for grain farming. It is leachy, and deterioration is rapid. Probably it could be best used for forest.

Elliott silt loam (146)

Elliott silt loam is a dark-colored soil developed under prairie vegetation on undulating to rolling topography. It covers the major portion of the north half of the county, occupying a total area of 172.16 square miles, or nearly 20 percent of the area of Vermilion county.

The surface horizon on the undulating portions is 8 to 10 inches thick and is a dark-brown heavy silt loam, while that of the rolling portions is usually only 4 to 6 inches thick and is a light-brown silt loam. In places a considerable amount of fine sand is present. Organic-matter and nitrogen content vary from high to medium, while acidity varies from almost neutral to medium. The subsurface is usually 6 to 8 inches thick and varies in color from brown or grayish-brown to light-brown. The subsoil is 10 to 16 inches thick and is commonly a yellowish-brown compact and medium-plastic clay loam or silty clay loam that breaks in the upper part into ¼- to ½-inch distinctly subangular aggregates with drabish coatings. The lower part may contain a few pebbles, while the aggregates become larger and tend to disappear. Below 28 to 32 inches the material is a compact and medium-plastic highly calcareous glacial till. A mixture of shale, chert, and limestone fragments, together with some crystalline rocks and pebbles, constitute the coarser fraction of the unweathered till, tho the greater portion is made up of shale.

Along much of the face of the Outer Bloomington moraine, which is the southern boundary of the extensive area of Elliott silt loam in the county, there

is a silty covering that varies from a few inches to several feet in thickness. Where this silt blanket is thin, the development of an Elliott silt loam profile has been about normal, but where the silt is thick, a youthful, well-drained profile has developed that resembles Catlin silt loam (page 34). The areas of thicker silt are so irregular in occurrence and so variable in extent that no distinction in soil type was made, except on the lower morainic slopes, where the areas of thicker silt could be mapped out. The soil developed on these areas was correlated with Catlin silt loam, Type 171.

As mentioned previously (page 10), some of the till to the north, east, and northeast of Rossville is pebbly, friable, and permeable. Soils developed on this sort of glacial till are ordinarily correlated with Saybrook silt loam. In this region, however, this permeable till occurs in very irregular areas and is mixed



FIG. 11.—EROSION HAS STARTED ITS DESTRUCTIVE WORK ON THIS FIELD OF ELLIOTT SILT LOAM

This gully has started in a field of alfalfa located on a slope of only 2 percent. This illustrates how carefully this soil type must be handled if erosion is to be prevented.

with more-compact material. For the most part the permeable till occurs only as a thin covering on top of the compact, slowly permeable till. The difficulties of showing on the map the areas underlain by the more permeable till were so great that no attempt was made to do so; their presence in this region should, however, be noted. For a more complete discussion of Saybrook silt loam see the Ford county soil report, No. 54.

Use and Management.—Since Elliott silt loam, as mapped in Vermilion county, occurs on such variable topography, systems of soil management must vary accordingly. The less-sloping portions are more productive and need less protection against erosion than do the rolling areas, but the problem of drainage requires more attention. On the rolling areas (slopes of 5 percent or greater), erosion is a very serious problem, since the underlying glacial till is slowly

permeable to water. Furthermore the subsoil and slowly permeable glacial till lie nearer to the surface on the slopes than on the more nearly even areas. Contour farming and strip cropping are recommended as erosion-control practices, and special emphasis should be placed on increasing the acreage of legumes, small grains, and pasture. Slopes greater than 2.5 percent should not be fall-plowed, and it is not good practice to fall-plow even very gentle slopes. Tests for acidity, available phosphorus, and available potash should be made and all adverse conditions corrected in planning a well-balanced system of soil treatment. Frequent and regular applications of barnyard or green manure should be made.

Mixed Elliott silt loam and Clarence silt loam (146)

(Shown with cross-hatching on the map)

This combination of soil types, presented as a unit on the accompanying map, represents a gradation between Elliott silt loam and Clarence silt loam as well as an intermixing of these two soil types. The subsoil and the underlying glacial till are slightly more plastic than are those of Elliott silt loam proper; consequently underdrainage is slower. Erosion is more serious for a slope of the same grade. Except for these conditions, the profile characteristics are very similar to Elliott silt loam and soil treatment should be similar.

The area occupied by these mixed types is nearly 49 square miles.

Clarence silt loam (147)

Clarence silt loam occupies an area of 13.73 square miles. It occurs only in the northern part of the county and principally in the northwest corner around Rankin. It is a medium-dark soil that has developed under prairie vegetation on undulating to rolling topography.



FIG. 12.—FAIRLY TYPICAL GULLY FORMATION ON CLARENCE SILT LOAM

Here the slope of the land is between 5 and 6 percent. Vigorous measures must be taken to prevent such devastation as is rapidly developing on this area.

The surface is 4 to 8 inches thick, depending on the degree of slope. It is a brown to grayish-brown silt loam medium in organic matter and nitrogen and medium acid in reaction. The subsurface is 3 to 6 inches thick and is a pale drabbish-yellow to drabbish-gray slightly plastic clayey silt loam. The subsoil is 8 to 12 inches thick and is a dull drabbish-yellow to olive compact plastic clay loam that breaks into $\frac{1}{8}$ - to $\frac{1}{2}$ -inch drab-coated nearly angular aggregates. The unweathered parent glacial till begins at 20 to 24 inches beneath the surface and is a yellowish-gray to gray highly calcareous compact and plastic fine-grained till. Light-gray lime fills the seams and cracks for 2 or 3 feet but gradually fades out as the material becomes massive,—that is, without definite structure. This gray plastic impervious till may be but a foot or two thick and be underlain with a less plastic till, or it may extend down to an undetermined depth. Pebbles are less abundant than in the till from which Elliott soils are derived and a greater portion are shale.

Use and Management.—Clarence silt loam is recognized as a relatively poor soil thruout the region in which it occurs. Its location in the midst of productive corn-belt soils, where such a soil would not be expected to occur, delayed its complete recognition until about 1929. This soil is not particularly deficient in plant foods but unfavorable physical properties limit its value. The subsoil and underlying till are so nearly imperious that percolation is very slow. Tile do not draw satisfactorily, and after each heavy rain the surface runoff carries away immense loads of the valuable surface silt. This removal has progressed so far that the surface horizon material is entirely gone from many slopes (Fig. 12).

There seems to be no possibility of ever overcoming the basic handicap imposed on this soil by the unfavorable underlying material laid down centuries ago by the ice sheets. The present level of productivity can, however, be improved and, what is equally important, more rational utilization be made of this soil type.

There are no experiment-field results from which to draw suggestions for the treatment of Clarence silt loam. It can be said, however, that attention should first be given to preventing, in so far as possible, the continued loss of surface material by erosion. Contour farming and strip cropping will have to be resorted to on many slopes. Fall plowing should never be practiced. A cover crop of some sort should be kept on the land during the winter season, and the heavier and thicker the growth of this crop, the greater will be the protection afforded. Wheat, rye, the biennial clovers, and possibly alfalfa, may be used for this purpose. A liberal use of sweet clover is recommended, as it will grow fairly well following a light application of limestone and will help to correct the nitrogen and organic-matter deficiency. If the sweet clover is utilized for pasture and seed production, enough seed will usually shatter to reseed the crop satisfactorily, tho this method of reseeding should not be depended upon exclusively, especially if a rather poor or spotted stand was present the year before. Bulletin 394 contains information on the growing of this crop.

The utilization of this soil presents problems which should be given careful study. The continued production of grain may not be the best way to use this land. Its physical limitations are reflected in unsatisfactory yields, and no method of entirely overcoming these limitations is known. Since this soil will grow good sweet clover, consideration might well be given to the establishing of larger

farm units, so that more of the land might be kept in pasture and livestock production made a prominent part of the farm business. Areas of good soil occur thruout the region where Clarence soils predominate, so that with larger farm units the better portions could be used for grain crops and the poorer land for pasture.

Brenton silt loam (149)

Brenton silt loam is a dark-colored soil developed under heavy prairie-grass vegetation on undulating topography. It occurs on small, low knolls and the lower slopes of the larger knolls and ridges in the southern part of the county. It occupies 91.53 square miles or about one-tenth of the total area of the county.

The surface is 8 to 10 inches thick and is a brown to dark-brown indistinctly granular friable silt loam high in organic matter and nitrogen and slightly acid to neutral in reaction. The subsurface is 8 to 10 inches thick and varies from



FIG. 13.—VIEW OF THE FAIRMOUNT STONE QUARRY

This quarry, representing about two square miles of excavation, is now largely filled with water. Brenton silt loam largely surrounds the quarry and probably once covered most of it. Material for road making, flux stone used in the manufacture of iron and steel, and agricultural limestone have been mined from this deposit. Samples of the rock examined by the University of Illinois during past years showed the stone to have well over 90 percent of calcium carbonate equivalent.

dark brown to light brown. The subsoil is 12 to 16 inches thick and is a brownish-yellow to dull drabbish-yellow medium-plastic silty clay loam that breaks into $\frac{1}{4}$ - to $\frac{3}{4}$ -inch dark drab-coated aggregates. At 30 to 35 inches beneath the surface the subsoil structure disappears, and the material becomes a fine friable loess-like silt bright yellow in color and mixed with gray. There are numerous fine thread-like channels of drab organic matter in this layer, some small brown specks or concretions of iron, and occasionally a few pebbles. This material may be as much as 2 or 3 feet thick but it usually is not more than 10 or 12 inches thick. Below 40 to 45 inches it varies from coarse pebbly till to stratified silt, sand, and gravel outwash.

Use and Management.—This is a very desirable, productive, general-farming soil. It occurs only on slopes grading $\frac{1}{2}$ to 2 percent and does not seriously erode. It tiles well, and following the construction of dredge ditches in the widespread flat areas, drainage has not been a difficult problem. Furthermore the soil is easy to work. It is either nonacid or only very slightly acid. It is well supplied with organic matter and nitrogen except on the lighter-colored portions, and probably has sufficient phosphorus and potassium to make it unnecessary at present to apply fertilizers high in those constituents. Tests for acidity, available phosphorus, and potassium should all be made, however, before assuming that no lime or fertilizers are needed anywhere within the type. Circulars 346 and 421 and the mimeographed folder describing the Illinois potash test will be of assistance in making these tests.

The abundant supply of organic matter, particularly on the more nearly level areas, may lead to the erroneous conclusion that no provision need be made for the return of crop residues or other organic materials. This soil responds well to leguminous organic materials; and unless such additions are made, a high level of production cannot be maintained. Grain crops grow well. A rotation including legumes will usually maintain a high productive level for some time without any soil treatment other than the application of limestone.

Onarga sandy loam (150)

Onarga sandy loam occurs on the sandy knolls and ridges found mostly in the west-central part of Vermilion county. It has developed under conditions of low moisture and with scanty prairie grass as the natural vegetation. It is a minor type, occupying only 1.11 square miles.

The surface horizon varies from 6 to 14 inches in thickness and is a brown to light-brown incoherent sandy loam low in organic matter and nitrogen and acid in reaction. The subsurface, where distinguishable, is a yellowish light-brown incoherent loamy sand. The subsoil is yellow to reddish yellow in color and is a slightly coherent clayey sandy loam to incoherent loamy sand. Below 35 to 40 inches the material is incoherent loose sand or stratified sand and gravel.

Use and Management.—This is not a particularly productive soil, and the coarse texture and low water-holding capacity tend to make it drouthy. It usually shows tremendous response in favorable seasons to additions of fresh organic matter. No attempt should be made, however, to build up a very large reserve of this material, as the open texture of the soil hastens the decomposition and dissipation of organic materials. Sweet clover can be grown to advantage, but a test for acidity should first be made and limestone applied in the amounts indicated by the tests. Following sweet clover, alfalfa does well. But if alfalfa is to be grown, a test for available phosphorus should be made as directed in Circular 421, and a phosphate fertilizer should be applied to make up the deficiency of this essential element. The small grains ordinarily do fairly well on this soil.

Drummer clay loam (152)

Drummer clay loam is a dark-colored heavy soil that has developed under sough-grass vegetation on nearly level to depressional topography. It occurs

thruout the county but is more widespread in the southern half, making up more than 40 percent of the land area of many of the townships. It is the most extensive type in Vermilion county, covering all told 240.02 square miles, or more than a quarter of the county.

The surface horizon is 8 to 10 inches thick and is a black to drabbish-black silty clay to clay loam high in organic matter and nitrogen and neutral in reaction. The subsurface is often an extension of the surface but is usually more drabbish or grayish in color. The subsoil is a continuation of the surface and is a drabbish-



FIG. 14.—A FIELD OF DRUMMER CLAY LOAM, THE MOST EXTENSIVE TYPE IN VERMILION COUNTY

This soil type is not only the most extensive type in Vermilion county but also has the highest productivity rating. Corn may be grown two years out of four if a leguminous green-manure crop appears once in each rotation period. Across the background stretches a section of the Bloomington moraine.

gray clay loam, usually containing some spots or splotches of yellow and rusty brown. Below 35 to 40 inches there is usually a mixed silty, sandy, gravelly outwash material that is often calcareous. In a few instances in the northern half of the county, no friable sandy outwash material occurs under the subsoil. This is especially true in the Clarence silt loam area around Rankin, where the clay loam profile seems to have been developed directly upon the underlying plastic till. This is an important factor in underdrainage and it has considerable influence on the use that can be made of this type in these areas.

Occasionally a few poorly drained, ponded spots occur within the Drummer clay loam areas. These are often not farmed because water stands in them much of the year. They are never large, seldom occupying as much as an acre, and may often be left to grow up in willow sprouts or weeds.

A third variation in this soil type consists of gravelly areas, particularly just to the south of the Outer Bloomington moraine in Township 20 North, Ranges 13 and 14 West. The percentage of gravel is not great enough to be harmful, and no special soil treatment need be planned.

Use and Management.—Drummer clay loam is a productive general-farming soil. Surface drainage is very slow or entirely absent, and all excess water must be removed either thru evaporation or percolation. The construction of dredge ditches and laying of tile have been effective, and most of this Drummer type in Vermilion county is now well drained.

Drummer clay loam is a good corn soil. This crop may be grown two years out of four, provided a leguminous green-manure crop appears once each rotation period. Barnyard manure may replace the green-manure crop if regular applications are made. Trial applications of potash should be made, especially if spots of Harpster clay loam are present, in order to determine the need of the corn crop for this material. This requirement may also be determined by following the directions in "The Illinois Potash Test." Ordinarily no limestone is needed on this soil to grow good sweet clover, and available phosphorus is usually high enough for all needs tho it is always wise to test all fields before drawing definite conclusions.

Altho fall plowing is not often an advisable procedure on the silt loams, this is one soil type that may be fall-plowed to advantage. If plowed when too wet or too dry, it tends to clod and consequently will not work into a firm seedbed. However, if plowed in the fall, the freezing and thawing of the winter and spring will melt or break down the clods so that a good seedbed can be prepared.

Ridgeville sandy loam (156)

Ridgeville sandy loam is a dark-colored sandy soil developed on small, low knolls or on the lower slopes of knolls and ridges occupied by Onarga sandy loam, Type 150. It occurs on nearly level to undulating topography and has developed under a heavy prairie-grass vegetation. This type covers altogether 2.78 square miles.

The surface horizon is 7 to 10 inches thick and is a brown to dark-brown sandy loam relatively high in organic matter and nitrogen and slightly acid in reaction. The subsurface is 6 to 8 inches thick and is a drabbish-yellow sandy loam. The subsoil varies with underdrainage but, for the most part, is a slightly plastic sandy silt to sandy clay loam drabbish yellow in color or drabbish gray spotted with yellow. No well-defined structure is evident, and sometimes numerous pebbles resistant to weathering are present. Below 35 to 40 inches the material is usually a yellowish incoherent loose sand or stratified silt, sand, and gravel.

Since this type often occurs between ridges of Onarga sandy loam and the adjoining silt loam or clay loam it will often partake of the features of each of these adjoining types to a slight extent. In making a soil map it sometimes happens that division lines between two soil types cannot be drawn accurately enough to eliminate such a difficulty.

Use and Management.—This is a fairly productive soil if not too well drained,—that is, if the water table is not lowered so much by artificial drainage that drouthiness tends to develop during long rainless periods. Ditching or tiling is necessary in some areas. Most of this soil is somewhat acid in the upper horizons but is commonly neutral or alkaline in the underlying material. The test for acidity, as described in Circular 346, will indicate the amount of limestone to

apply in order to get a satisfactory stand of sweet clover. Tests for available phosphorus and potassium should also be made and these materials applied as needed. Fresh organic matter improves the productivity of this soil type and also tends to increase its water-holding capacity. Because of its relatively high content of sand, this soil cultivates easily.

Rankin sandy loam (157)

Rankin sandy loam occurs as sandy knolls and ridges thruout the northern part of Vermilion county and has been developed under thin or scanty prairie vegetation. It occupies 10.78 square miles.

The surface horizon is 6 to 8 inches thick and is a brown to light-brown sandy loam medium low in organic matter and nitrogen and acid in reaction. The subsurface is a continuation of the surface but tends to be more yellowish and more loose and incoherent in consistency. The subsoil is a brownish-yellow slightly plastic clayey sand. Below 30 to 35 inches the material is a yellowish or reddish-yellow incoherent loose sand or gravelly sand. Sometimes this is underlain at 40 to 45 inches by compact calcareous till, but more often the sand extends to an indefinite depth.

This material appears to have been deposited by water flowing from a retreating glacier. It is somewhat coarser in texture and more acid than Onarga sandy loam.

Use and Management.—From the point of view of usage, this soil is not much different from Onarga sandy loam, and the treatment and management practices can be the same (see page 29).

Vance silt loam (158)

Vance silt loam is a light-colored soil developed under a deciduous forest vegetation on undulating to rolling topography. It occurs along the streams in the south half of the county, occupying an area of 71.24 square miles.

The surface horizon is 5 to 7 inches thick and is a yellowish-gray silt loam low in organic matter, nitrogen, and available phosphorus. In undisturbed forest areas the upper 2 to 3 inches is brownish gray in color due to an accumulation of forest litter. The subsurface is 6 to 8 inches thick and is a grayish-yellow to yellow silt loam. The subsoil is 12 to 16 inches thick and is a brownish-yellow to reddish-yellow medium-plastic silty clay loam that breaks into $\frac{1}{4}$ - to $\frac{3}{4}$ -inch subangular aggregates with grayish coatings on the cleavage faces. At 30 to 35 inches the lower subsoil usually grades into a yellow or yellow-and-gray silt, but occasionally this silty loess-like layer is absent and the weathered portion of the soil mass is developed directly on a brownish-yellow leached material of mixed sand and gravel, probably either outwash or a leached till. Calcareous till is normally encountered 45 to 60 inches beneath the surface.

Along the border between Vance silt loam and the dark-colored soils, particularly Brenton silt loam, Type 149, there is ordinarily a narrow transition belt which shows light timbering, probably having been occupied by a brushy cover with a scattering of large trees. For the most part these transition soils have been included with Vance silt loam, altho the surface horizon is ordinarily some-

what darker than that of Vance silt loam. The subsurface, however, shows a distinct gray cast which definitely excludes it from the dark-colored group as mapped in this county.

A few very small, gray, poorly drained spots have also been included with this type. These occur as small pond-like, undrained spots only in the more extended nearly level areas.

Use and Management.—The surface slope of Vance silt loam in this county is rather variable; treatment must therefore vary somewhat also. Even tho the subsoil and underlying material are both moderately permeable, erosion is a problem on slopes greater than 3 or 4 percent that are under cultivation. Tile draw satisfactorily thruout the type. Altho this soil is acid and low in all important elements of plant food, it will respond readily to good treatment. Testing for acidity, as directed in Circular 346, and applying limestone as recommended should be the first step in introducing a well-planned system of soil treatment. Following this, sweet clover should be seeded and the crop returned to the soil as green manure. This practice should be continued as part of a regular crop rotation. Barnyard manure gives very good returns on this soil, and on livestock farms the sweet clover affords excellent pasture. Bulletin 394 will prove helpful in understanding the requirements of this crop. Corn should not appear often in a well-planned crop rotation,—at least not more than once in four or five years and then only following a legume crop.

The more pronounced slopes would better be put into permanent pasture, but before doing this limestone should be applied.

Pilot silt loam (159)

Pilot silt loam is a medium-dark soil developed under prairie-grass vegetation on undulating to gently rolling topography. It occurs in isolated areas in which the underlying coarse sandy or gravelly outwash is less than 30 or 35 inches beneath the surface. It occupies a total area of 3.21 square miles.

The surface horizon varies from 6 to 10 inches in thickness and is a brown to light-brown or grayish-brown silt loam to sandy silt loam. The subsurface is 4 to 6 inches thick and is a grayish-brown to yellowish-brown silt loam or sandy silt loam. The subsoil is 8 to 12 inches thick and is a slightly plastic sandy clay loam varying in color from a brownish yellow to a yellowish gray. Below 20 to 30 inches the material is coarse and gravelly, tho it may not become loose and incoherent until 35 to 40 inches beneath the surface.

Use and Management.—Pilot silt loam tends to be drouthy, especially where the underlying loose sand or gravel lies less than 30 inches beneath the surface. Additions of fresh organic matter should be made at frequent intervals, either in the form of barnyard manure or of green manure. An application of limestone is usually necessary to secure a good growth of sweet clover. Corn should not often be grown on this land. Testing for acidity and available phosphorus, as described in Circulars 346 and 421, will be useful in planning a soil-treatment program, and Bulletin 394 contains valuable information on the growing of sweet clover.

Catlin silt loam (171)

Catlin silt loam is a medium-dark soil developed on gently rolling to rolling topography under prairie-grass vegetation. It occurs most extensively on the sides of the morainal ridges in the southern part of the county. It occupies an area of about 63 square miles.

The surface horizon is 8 to 10 inches thick and is a brown to light-brown silt loam medium in organic matter and nitrogen and medium to slightly acid in reaction. Available phosphorus is usually medium to low. The subsurface is 5 to 7 inches thick and is a light-brown to yellowish-brown silt loam. The subsoil is 14 to 18 inches thick and is a brownish-yellow or dull-yellow slightly plastic silty clay loam which breaks into $\frac{1}{4}$ - to $\frac{1}{2}$ -inch irregular or indistinctly sub-angular aggregates with drabbish-yellow coating. At 30 to 36 inches beneath the surface the lower subsoil grades into yellow or mixed yellow and gray fine friable loess-like silt. Coarser material containing pebbles is usually encountered between 40 and 50 inches down. This may be outwash, leached till, or calcareous till.

Due to the caving in of abandoned coal mines small sink-holes are becoming numerous south and west of Hegeler, Kellyville, and Westville. Both Brenton silt loam, Type 149, and Catlin silt loam are described as occurring on knolls and ridges, yet in this area, because of sinking, the topography of either of these types may now be flat or even depressional. Since this sinking is very recent, no change in the soil profile has occurred as yet, tho some future change may be expected unless good artificial drainage is maintained.

Use and Management.—Catlin silt loam normally occurs on slopes of 2 to 4 percent grade. The subsoil and underlying material are permeable; consequently natural drainage is good and tile draw satisfactorily. Altho, in general, erosion is not particularly destructive, it often causes serious damage on the steeper slopes. Fall plowing should not be practiced, and use should be made of winter cover crops. This is a fairly good general-farming soil that responds to intelligent management, but deterioration is rapid under poor farming practices. Farming on the contour is one method that will help to retain the valuable surface horizon. Strip cropping should be introduced wherever feasible. Sometimes the use of well-constructed terraces may be practical.

Catlin silt loam is a good alfalfa soil and, for those engaged in livestock production, extensive use should be made of this crop. Tests for acidity should be made as described in Circular 346, and limestone applied as indicated by the tests. Following this a crop of sweet clover may well be grown, which will insure a more satisfactory stand of alfalfa when a seeding of this crop is made. Corn does well on this soil but should be used only once in three or four years as part of a regular crop rotation. Such a rotation should include one crop of clover, preferably sweet clover, which can be used as a pasture crop and then plowed under for green manure. Following an increase in organic-matter supply, a test should be made for available phosphorus and potassium to determine the needs for these minerals.

Myersville sandy loam, terrace (172)

Myersville sandy loam, terrace, is a dark-colored sandy loam soil developed under a grass vegetation on low terraces subject to a high water table. It occurs

most extensively along North Fork just to the south of Hoopeston. It occupies an area of practically 2 square miles.

The surface horizon is 8 to 10 inches thick and is a dark-brown to black sandy loam fairly high in organic matter and nitrogen and probably medium in available phosphorus. The subsurface is a grayish-black to gray sandy loam. The subsoil varies from a slightly plastic sandy clay loam to a nonplastic sandy loam and from grayish brown to yellowish brown. Below 30 to 35 inches the material is incoherent loose sand and gravel.

Use and Management.—Myersville sandy loam is similar to Leeds sandy loam, No. 141, but must be differently used since portions of it are subject to overflow. The management recommendations made for Leeds (page 23) should be followed for Myersville so far as practicable.

SUMMARY OF CHARACTERISTICS OF VERMILION COUNTY SOILS

For convenience in comparing the soils of Vermilion county, a brief summary of their more important characteristics and properties is given in Table 2 on the next page. Topography, drainage, and organic-matter content of each type are shown, and also the reaction of the soil with regard to acidity and the content of available phosphorus. The inherent productivity index is shown for field crops, for pasture, and for forest.

These records, it should be emphasized, are to be taken only as general indications of the conditions found on the respective soil types; they do not necessarily represent conditions on every individual farm or field. Past treatment of a field with respect to tillage and cropping may have produced considerable change in acidity and in productivity; and for that reason the tests, as outlined in the publications listed on page 14, should be applied when soil treatment is contemplated.

A feature of very recent origin, that will have an effect on the land, is making its appearance in certain parts of Vermilion county. Numerous small sink-holes are forming where abandoned coal mines are caving in. At present these sink-holes are limited mainly to the region between Hegeler and Catlin and south to Georgetown. They cause wet spots, and when they occur directly beneath farm buildings or tile lines they do serious damage. They are usually small and shallow, seldom sinking more than 2 or 3 feet and can ordinarily be farmed across.

TABLE 2.—VERMILION COUNTY SOILS: SUMMARY OF CHARACTERISTICS

Type No.	Type name	See page ¹	Topography ²	Drainage ³		Organic matter	Reaction	Available phosphorus	Productivity indexes ⁴		
				Surface	Under				Field crops	Pasture	Forest
22	Westville silt loam.....	14	Rolling	Rapid	Moderate	Low	Acid	Low	7	B	A
23	Blount silt loam.....	15	Undulating to rolling	Moderate to rapid	Slow	Low	Acid	Low	6-7 ⁵	B	A
25	Eroded Calcareous Gravelly Loam.....	16	Steep	Excessive	Low	10	C	B
55	Sidell silt loam.....	17	Rolling	Rapid	Moderate	Medium to low	Medium acid	Low	4-6 ⁵	B	A
67	Harpster clay loam.....	19	Nearly level to depression	Slow	Moderate	High	Alkaline	High	4		
73	Huntsville loam, bottom.....	19	Nearly level	Slow	Moderate	Medium to high	Neutral	High	5	A	A
81	Littleton silt loam, terrace.....	21	Undulating	Moderate	Moderate	Medium	Medium acid	High	4		
87	Sumner sandy loam, terrace.....	21	Undulating to gently rolling	Moderate	Rapid	Medium low	Acid	Low	6-7 ⁶	B	B
103	Muck.....	21	Depressional	Slow	Moderate	High	Neutral	Medium to high	4		
134	Camden silt loam, terrace.....	22	Undulating	Moderate	Moderate	Low	Acid	Low	5-6 ⁶	B	A
135	Potomac sandy loam, terrace.....	23	Undulating to gently rolling	Moderate	Rapid	Low	Acid	Low	8	B	B
141	Leeds sandy loam.....	23	Undulating	Moderate	Moderate	Medium high	Slightly acid	Medium	4		
144	Alvin sandy loam.....	24	Rolling	Rapid	Rapid	Low	Acid	Low	8	C	B ^a
146	Elliott silt loam.....	24	Undulating to rolling	Moderate to rapid	Slow	Medium high	Medium acid	Low to medium	3-6 ⁵		
146M	Mixed Elliott silt loam and Clarence silt loam.....	26	Undulating to rolling	Moderate to rapid	Slow	Medium high	Medium acid	Low to medium	4-6 ⁵	B	B
147	Clarence silt loam.....	26	Undulating to rolling	Moderate to rapid	Very slow	Medium	Medium acid	Low to medium	5-7 ⁵	B	B
149	Brenton silt loam.....	28	Undulating	Moderate	Moderate	High	Slightly acid	Medium	2		
150	Onarga sandy loam.....	29	Gently rolling to rolling	Moderate	Rapid	Medium	Acid	Low	6	B	A
152	Drummer clay loam.....	29	Nearly level	Slow	Moderate	High	Neutral	High	1		
156	Ridgeville sandy loam.....	31	Undulating	Moderate	Moderate	Medium high	Slightly acid	Medium	4		
157	Rankin sandy loam.....	32	Gently rolling to rolling	Moderately rapid	Moderate	Medium	Medium acid	Low	6	B	A
158	Vance silt loam.....	32	Undulating to gently rolling	Moderate to rapid	Moderate	Low	Acid	Low	5-7 ⁵	B	A
159	Pilot silt loam.....	33	Gently rolling	Moderate to rapid	Rapid	Medium	Acid	Low	5-7 ⁶	B	A
171	Catlin silt loam.....	34	Gently rolling to rolling	Moderately rapid	Moderate	Medium	Slightly acid	Low to medium	3		
172	Myersville sandy loam, terrace.....	34	Undulating	Moderate	Moderately rapid	Medium high	Slightly acid	Medium	4		

¹For description of soil type turn to page indicated.²Topography is expressed by the following terms based on the respective slopes: *nearly level*, less than .5 percent slope; *undulating*, .5 to 1.5 percent; *gently rolling*, 1.5 to 3.5 percent; *rolling*, 3.5 to 7 percent; *strongly rolling*, 7 to 15 percent; *steep*, greater than 15 percent.³Of the terms used to express drainage "moderate" expresses the most desirable drainage.⁴The index number assigned to a soil type for production of field crops is based on its ability to produce the major crops grown in the region, without soil treatment but with the soil in a cleared and drained condition. The scale used is 1 to 10, the *most productive soil* in the state being rated as 1 and the *least productive* as 10. The indexes for pasture and forest are indicated by A, B, C, with A signifying the best and C the poorest.⁵The variable rating is due principally to variations in degree of erosion.⁶The variable rating is due principally to differences in depth to underlying loose sand and gravel.

Soil Reports Published

- | | |
|----------------------|---------------------|
| 1 Clay, 1911 | 32 Randolph, 1925 |
| 2 Moultrie, 1911 | 33 Saline, 1926 |
| 3 Hardin, 1912 | 34 Marion, 1926 |
| 4 Sangamon, 1912 | 35 Will, 1926 |
| 5 LaSalle, 1913 | 36 Woodford, 1927 |
| 6 Knox, 1913 | 37 Lee, 1927 |
| 7 McDonough, 1913 | 38 Ogle, 1927 |
| 8 Bond, 1913 | 39 Logan, 1927 |
| 9 Lake, 1915 | 40 Whiteside, 1928 |
| 10 McLean, 1915 | 41 Henry, 1928 |
| 11 Pike, 1915 | 42 Morgan, 1928 |
| 12 Winnebago, 1916 | 43 Douglas, 1929 |
| 13 Kankakee, 1916 | 44 Coles, 1929 |
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| *25 Livingston, 1923 | 56 Schuyler, 1934 |
| 26 Grundy, 1924 | 57 Clinton, 1936 |
| 27 Hancock, 1924 | 58 Washington, 1937 |
| 28 Mason, 1924 | 59 Marshall, 1937 |
| 29 Mercer, 1925 | 60 Putnam, 1937 |
| 30 Johnson, 1925 | 61 Wabash, 1937 |
| 31 Rock Island, 1925 | 62 Vermilion, 1938 |

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